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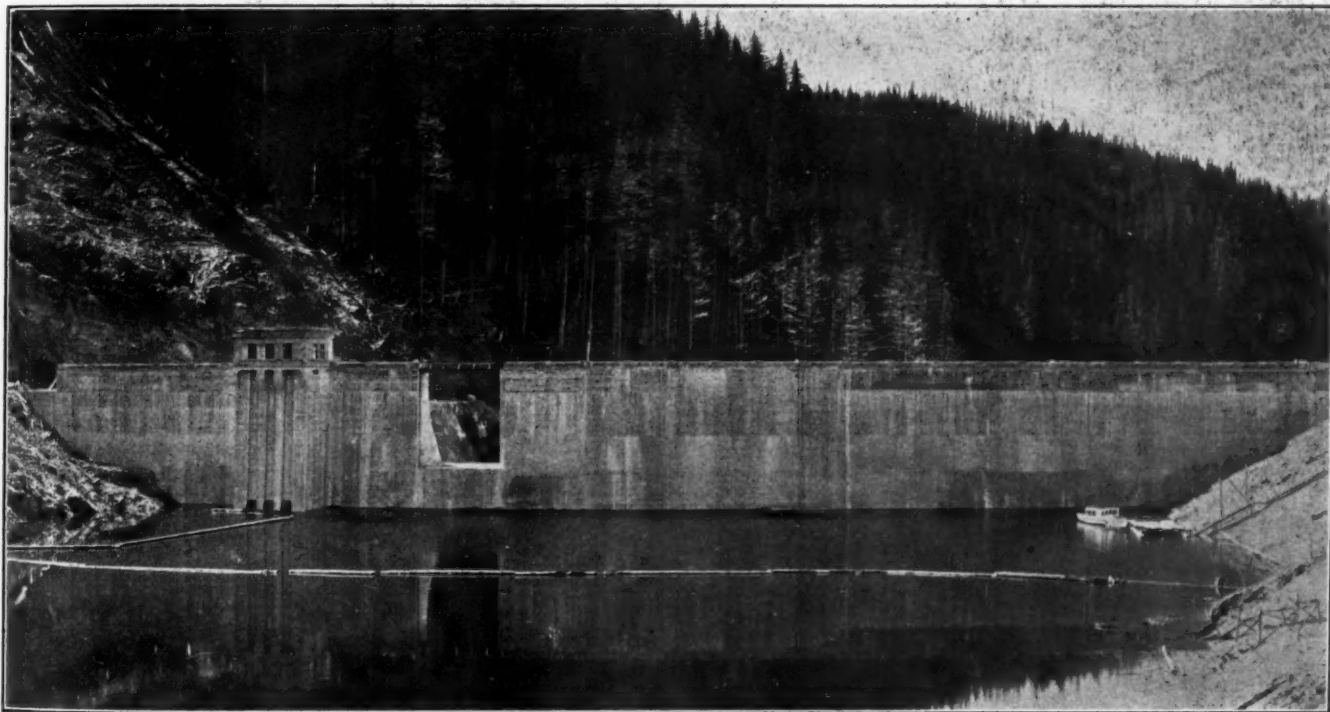
SEALING SEATTLE'S RESERVOIR

Recommendations of Four Engineers for Making Water Tight a Reservoir in Porous Gravel Covering Nearly Two Hundred Acres—Effectiveness of Silting—Use of Asphaltic Concretes—Estimated Costs.

The city of Seattle, Wash., operates a municipal hydro-electric power plant, power being obtained from the Cedar river at a point about 40 miles from the city. Heretofore a basin known as Cedar lake has been used as a storage reservoir, a rock-filled crib dam being placed across the river here. It was desired to considerably increase the storage capacity at this point to provide for increasing the available power, and in 1914-1915 a masonry dam was built on a rock foundation in the bed of the river.

the sand and other coarser materials which underlay it. Under these sands and gravels, in turn, are probably boulders which in some cases form pockets, or at least have not their interstices completely filled with fine material.

The result of this condition was that when water rose behind the completed masonry dam, it found its way into and through the coarse material where the lowering of the new channel had removed the watertight sedimentary covering, water escaping in such large quantities through



MASONRY DAM ACROSS CEDAR RIVER. RESERVOIR PARTLY FILLED.

It seems that sometime within the geological history of this district, while glaciers were still reaching down into this section of the country, the river had followed a course further north than its present one. This old channel, however, had been filled with morainic material from the glaciers, which dammed up this outlet and raised the water until it overflowed into its recent channel. At the beginning the rock on which the present dam rests rose considerably higher than the present stream bed, and silt was deposited in the lake formed behind this ledge and the moraine. During the following centuries the stream apparently wore down the rock dam, and as the channel lowered, it washed out the silt and part of

this material as to make storage behind the masonry dam impossible.

In order to determine what procedure would be most effective in making impervious the bed of the reservoir behind the masonry dam as far back as the present Cedar lake (the bed of which is already well covered with clay), the city called upon three consulting engineers to report upon the matter, and on August 2nd city engineer A. H. Dimock submitted to council the reports of William Mulholland, chief engineer of Bureau of Water Supply of Los Angeles, Frederic P. Stearns of Boston, Mass., and R. H. Thomson of Seattle, Wash. These reports were, of course, prepared with a special view to the reser-

voir in question, but are of considerable general interest because of their bearing upon other reservoirs, canals or other structure in which water is retained by earthen embankments. As described above, the problem is how to make tight a reservoir which consists largely of a channel eroded in porous, gravelly material with comparatively steep banks. The area to be covered is large (about 190 acres) and consequently the matter of cost becomes a very important element of the decision.

Cutting off the leakage by sheet piling or a cut-off wall across the old river channel was found to be impracticable when it was learned that the rock underlying the moraine is probably at least 500 or 600 feet below the surface and the material above it and for a width of 7,000 feet consists of coarse sand, gravel and boulders, with very little clay or other fine material.

Probably no reservoir of this size has ever been covered with hand-laid waterproofing, but for such the natural deposit of silt has ordinarily been relied upon. Silting to secure imperviousness was naturally considered by the consulting engineers, and all agreed that it was undoubtedly the plan to be adopted providing it could be done successfully. Each recognized, however, that success by this plan might be questionable. They also

of the silting even on such area will be beneficial. Mr. Stearns, on the other hand, does not think that such silting as is practicable will render any of the area tight, but that some artificial lining will be necessary for the entire basin; while Mr. Mulholland believes that the silting will suffice at all points except along the slopes, where some impervious lining, preferably of an asphaltic nature, should be placed with a view especially to protection against wave action.

The efficiency of silt in making a basin watertight is not questioned by any of the engineers, but the only reason for doubting its practicability in this case was belief that sufficient clayey materials cannot be obtained to cover the large area involved. All agree that without adding such materials artificially to the water, waterproofing by silt deposits would not take place for a great many years. In submitting the reports, the city engineer states that since the first investigations by the consulting engineers further borings, and especially the clearing of some land on the hillside a short distance above the reservoir, have revealed enormous quantities of clay, a preliminary investigation leading to an estimate of considerably more than 300,000 cubic yards.

As to the depth of silt necessary, Mr. Thomson based



LOOKING UP THE CEDAR RIVER FROM A POINT EIGHTEEN HUNDRED FEET

agreed that before beginning the application of silt or any other method of treatment, the steep banks should be flattened, one said to a slope of 4 or 5 to 1, another to $2\frac{1}{2}$ to 1; it being recommended that this be done by hydraulicking the earth along the slopes into the bottom of the reservoir. Also that before doing this, all stumps and other vegetable matter should be removed from the reservoir site. Mr. Thomson prefers the silting method, and believes that it can be employed successfully, at least for a considerable part of the area, and that if any part still remains pervious after silting, some other waterproofing may be applied to that area, and that the effect

his estimate on an average of 30 inches depth of silt and sand in order to insure watertightness; but further on in his report says: "I have estimated upon a yardage of silt vastly greater, I believe, than will ever be required. The great increase of this yardage has been estimated on to the end that in any event there may be sufficient amount of funds in hand to thoroughly do the work, and so that if it should appear wise so to do, some special clays may be brought from a distance to mix with local materials. Concerning this, Mr. Mulholland does not believe "it will require in excess of 6 inches to one foot of clay for the lower submerged bottom. This can be

spread evenly and naturally by dumping the clay in suspension into the waters of the basin, permitting its even distribution by a natural process of sedimentation. I have had, in my own practice, many experiences of the effectiveness of thin deposits of clay over gravel beds for sealing them up, and hence have the greatest confidence in the result of this work: provided, of course, that my opinion is verified that an abundance of clay exists for this purpose in the neighborhood."

The idea of rendering a reservoir watertight by silting is by no means novel and the chief interest in this case is because of the large area involved and the extraordinary porosity of the soil to be treated. More novel are the considerations of methods for artificially waterproofing so large an area or any considerable part thereof.

The engineers considered for this purpose the use of concrete with watertight expansion joints, as has been used for reservoir work in a number of instances, and also the use of asphaltic materials more or less similar to the bituminous concrete or bituminous macadam used for road paving. In fact, Mr. Thomson in estimating the cost, assumes that the bituminous linings will be laid practically as are bituminous roads, and that the cost per square yard will be the same. He assumes, therefore,

rubber-like consistency, of 125 deg. penetration, to be brought to the work in tank cars. When heated to from 300 to 350 deg. F., to be jetted into the ground at a pressure of 50 pounds at the nozzle. The stream of asphalt to be played on the surface until a heavy coating shall have been formed. Immediately after forming this coat, there is to be jetted onto it sufficient amount of sand, heated to about 500 deg. F., to make a top coat of asphaltic concrete in addition to that formed by penetration of $\frac{3}{8}$ of an inch thickness. It being understood that this $\frac{3}{8}$ of an inch thickness is a dense combination of sand and asphalt into which the asphalt has been in part drawn by capillary attraction." This kind of surface, he states, was used for several hundred thousand square yards of roadway in the grounds of the Panama Pacific Exposition.

Still a third form of seal coat suggested would consist of a fuel oil emulsion mixed with gravel, sands and clayey material to make a mortar which could be mixed and laid at ordinary atmospheric temperature. This idea had already been made the basis of experiments by the city engineer, which were carried out in the municipal laboratory. In his report to the council, Mr. Dimock stated that these experiments had "demonstrated conclusively



ABOVE THE MASONRY DAM. POROUS NORTH BANK OF RIVER ON THE LEFT.

that the bottom of the reservoir would be thoroughly compacted by rolling and that the asphaltic material would be rolled while it was yet hot and plastic, beginning with a light roller and following with a heavier one. He figures on asphaltic concrete $1\frac{1}{2}$ inches thick after compression, and covered with a coat of liquid asphalt. He would then cover this with earth to an average depth of 9 inches over the entire basin, making it especially heavy on the upper portion to protect the lining from the effects of the rise and fall of the water.

Mr. Thomson also considered a second form of asphaltic lining, "asphalt of the highest quality of tough,

that such a lining can be made. These experiments show that by the use of fuel oil emulsions, or preferably of the heavier asphalt oils, mixed with hot sand, gravel and dust in proper proportions, a material can be made which shows a greater degree of impermeability than ordinary concrete. Furthermore, a lining of this character will possess sufficient elasticity to adapt itself readily to slight settlements of the foundation and to changes of temperature. It also has sufficient stability to resist wave action. Preliminary estimates indicate that a lining based on the use of a heavy asphaltic oil may be laid at an expense of approximately \$3,000 per acre." Mr. Thomson believes

that, while reservoir slopes of 1 to $2\frac{1}{2}$ could be constructed in case the heavier asphaltic lining is used, this oil emulsion mortar would require slopes of 1 to 4, and would therefore require removing about 850,000 cubic yards more than would grading for the other materials. Also this lining should, he thinks, be given a coating of sand and gravel averaging at least 9 inches thick, as is proposed for the other asphaltic coatings; but in this case it could not be spread by the hydraulic method but must be distributed from towers, which also would greatly increase the cost.

For a Portland cement concrete lining, Mr. Thomson estimates a bottom layer 5 inches thick and a top layer 3 inches thick, the bottom layer to receive a coating of liquid asphalt, and the top layer also to receive a similar coat. The bottom layer would be constructed in large squares with expansion joints and the top layer in similar squares so arranged that each corner common to four squares would come in the middle of a square of the bottom layer.

A considerable amount of the work would be common to all methods of treatment, these items and the estimated cost thereof being as follows: Clearing and grubbing, \$47,500; excavating and placing 400,000 cu. yds. of earth, \$60,000; surfacing cuts and fills, \$9,500; penstock channel through dam, \$10,000; rolling the ground to receive the waterproofing lining, \$19,000 for the 190 acres. Asphaltic concrete $1\frac{1}{2}$ inches thick after compression, covered with a coat of liquid asphalt, he estimates at 75c per square yard, or \$690,000. Applying an asphaltic seal coat under pressure he estimates at 25c per square yard, or a total of \$230,000. The oil emulsion mortar he estimates at 66 $\frac{2}{3}$ c per sq. yd. or a total of \$613,333; to which should be added, \$92,150 to provide for the flatter slopes and \$80,500 to provide for distributing the earth covering by towers rather than by the hydraulic method. Concrete lining he estimates at 90c per sq. yd., or a total of \$828,000. This would not need to be covered with an earth coating and therefore, for comparison with the other methods, should be diminished by \$34,500, the cost of the earth cover if put on by the hydraulic method.

Mr. Mulholland describes briefly the method suggested for hydraulicking down the banks and applying the clay for sealing the bottom. For the former the machinery recommended is "a 10-inch three-stage centrifugal pump that would supply about 7 second-feet of water to the jet, the jet to be a $3\frac{1}{2}$ -inch or 4-inch ordinary sluicing giant. It would be well to drive this direct-connected to a motor so as to make it reasonably portable. I believe the best result would follow if this pump were mounted on a barge and floated to a position close to the work in order to save piping and the frictional loss by added length to such pipe. . . . This operation should be comparatively inexpensive, as the number of men involved in its execution would not exceed over a dozen or so on a shift and would result in the movement of at least 3,000 to 4,000 yards per shift. The cost of the power I presume would be its mere cost of production, plus the small expense of the transmission line from the city's power plant." He estimates the cost of pump and motor at about \$10,000 or \$12,000, assuming that the pumping apparatus be floated on a log raft. The clay used for covering the submerged bottom to a depth of 6 inches could be "spread evenly and naturally by pumping the clay in suspension into the waters of the basin, permitting its even distribution by a natural process of sedimentation."

Concerning the making of a bituminous lining, Mr. Mulholland says: "It seems to me that if the ordinary gravel soil of the country contiguous to the ravine were passed through a rotary drier and heater such as is used

in a cement mill, and then passed, in a highly heated condition, through an ordinary cement mixer where it would receive the addition of from 12 to 15 per cent of its volume of heavy asphaltic oil, say from 10 to 11 gravity, the resulting mix, when properly spread and rolled down, would result in a coating of absolute impermeability, with a depth of, say, 4 inches." . . . "I firmly believe that this process will give not alone an impervious coating, but one having flexibility and resistance to wave action."

In submitting these reports to council, city engineer Dimock recommends that sufficient funds be provided at this time to carry on the preliminary work of clearing, cutting down the banks and sluicing in clay. He estimates the cost of this as follows: Clearing 200 acres, \$40,000; grading, 1,500,000 cu. yds. at 12c, \$150,000; silting 300,000 cu. yds. at 20c, \$60,000; rebuilding penstocks, \$65,000; raising overflow crest of dam, \$5,000; engineering, superintendence and incidentals, \$60,000; a total of \$410,000. He states distinctly that it should be understood that this work is not expected to effect a complete solution of the problem, but that it is an essential preliminary and first step to any operation which may be undertaken to secure a tight and usable basin; and when this preliminary work has been done, it is possible that funds must be provided to place a lining over such portions of the basin as experience indicates may require it.

WEATHER CONDITIONS AND WATERWORKS REVENUES.

The matter of amount of water consumption is ordinarily discussed by waterworks officials from the point of view of unnecessary consumption and methods of reducing the same. In the case of Cincinnati, Ohio, however, a considerable reduction in consumption last year was not welcomed with rejoicing. The waterworks department states that it operated during 1915 at a loss of \$86,463, of which \$44,506 was caused by the copious rainfalls of that year. Because of the heavy rains during the summer, householders were not compelled to sprinkle their lawns or roadways, and as 65 per cent of the water is sold through meters, this reduction in consumption of course reduced the department's revenue also. The average reduction in consumption due to this cause was 6,000,000 gallons per day, the average total daily consumption for the year being approximately 50,000,000 gallons. That is, the reduction in consumption was about 12 per cent of the total consumption.

REVERE SEWERAGE ASSESSMENTS.

An item was published in our July 27 issue referring to the unsatisfactoriness of the method of making sewer assessments in Revere, Mass. A few days ago the superintendent of public works of that city, Carl G. Richmond, informed us that the city had succeeded this spring in having a special act passed by the Massachusetts legislature which provided for the manner of assessing, although it does not establish any definite amount to be levied, it being claimed that such action would be unconstitutional. The provisions of the act are as follows:

The municipal council shall determine what proportion of the cost of a system of sewerage or sewage disposal the city shall pay, but this shall be not less than a third nor more than a half of the whole cost. The remainder shall be paid by "the owners of the estates situated within the territory embraced and benefited thereby." This shall be assessed "proportionate to the benefit derived, and based upon the measurement of the area of the lots, or according to the valuation of the property, or in such other legal manner as may be determined by the municipal council; but no estate shall be deemed to be benefited until a sewer is constructed capable of receiving the

drainage, and in no case shall an assesment upon any estate exceed the value of the special benefit accruing thereto." Corner properties pay assessments on one street only, and no property shall be assessed a second time. No property not assessed for sewerage can connect with a sewer except by paying such charge as the city engineer may decide.

If an owner requests within three months after receiving his assessment notice, he may have the privilege of paying the assessment in ten equal annual installments, with interest at 6 per cent on each installment until paid. The installments are to be collected with the taxes. The assessment constitutes a lien upon the estate for three years, and, together with interest and costs, may be levied by the sale of the estate.

House connections may be built by the city from main to street line, and "such reasonable sum as the council shall determine" may be charged against the abutting property for the permanent privilege of using them; which sum may be the estimated average cost of all house connections throughout the system.

STREET OILING IN VICTORIA.

Advantages of keeping cost data and methods of doing so employed in Victoria, B. C., were the subject of an article in our August 17th issue. Several illustrations were given of the tabulation sheets used for recording the data obtained, and it was the intention to include the one used for street oiling data. This, however, was necessarily omitted for lack of space, but is given herewith.

As stated in the article referred to, the cost of oiling in 1914 was 1.23 cents per square yard, which was reduced to an average of 1.09 cents in 1915, owing partly to the lower cost of oil and labor, but partly also to the fact that the sand was distributed by machine instead of by hand. The cost in 1914 had been reduced from that of 1913 by 0.31 of a cent per square yard, about half of which reduction was due to improved method of handling the oil. The figures in the accompanying table

The figures in the accompanying table show that when the sand was spread by a sprinkler on a motor truck, the cost of sanding was reduced from an average of \$4.095 to \$3.08 per 1,000 sq. yds., and the amount of sand used from an average of 1.7 cu. yds. per 1,000 sq. yds. to 1.1 cu. yds. These figures show that 87 cts. of the saving was due to the smaller amount of sand used (made possible, it is said, because of the more uniform spreading by machine than by hand); and that 14.5 cents saving was decrease in wages and team hire. Variations in the cost of each item of expense from month to month are readily traced in the table. It is up to the official in charge to find the reasons for these and act accordingly.

STORM SEWERS UNDER SIDEWALKS.

The placing in the sidewalk space of many of the public service structures commonly placed underground, and generally in the roadway, is discussed in another article in this issue, one prominent city engineer advocating this where practicable. This has recently been done in the case of a storm sewer in Ann Arbor, Mich., by city engineer Manley Osgood, with the additional novelty that the sewer also served as sidewalk and curb. The sewer in question was made of concrete.

The sewer in question was made of concrete, with a flat reinforced top 6 feet wide, which served as the sidewalk, vertical side walls of varying depth, and a bottom dishd about 16 inches with an arc of 18-inch radius connecting two tangents. The top and side walls were made 6 inches thick. The inside width of the sewer was 5 feet; the depth varied, as the bottom had

Report on Street Oiling for 1915.									
Month—		Estimated Cost.		Actual Cost					
				Men's wages, including motor driver and part of Foreman's.		Hired Teams and Cartas.		City Teams and Cartas.	
				Total.					
April	\$.....	\$2,990.30	.....	.....	.....	.....	.....
May	\$76.35	.....	.....	.....	.....	.....
June	\$18.00	.....	.....	.....	.....	.....
				28.50	.....	.....	.....	.....	.....
			
				33.10	.....	.....	.....	.....	.....
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			
			

a continuous fall of 3 per cent, while the grade of the sidewalk varied. The sidewalk pavement (top of sewer) was placed at the curb line, and the outer edge of the sewer top served as the curb. Combined gutter and curb inlets were provided at seven points. The sewer is about 1,500 feet long and cost about \$4 per lineal foot, including all appurtenances; the unit costs being 65 cts. per cu. yd. for excavation, \$8.45 per cu. yd. for concrete, 2 cts. per sq. ft. for reinforcing, \$12 each for iron box inlets, and \$5.50 each for cast iron covers.

The same method could of course be employed where the sidewalk pavement was not at the curb line, by running pipes from inlet opening to sewer. The plan would seem to require a sewer on each side of the street or else the use of culverts at some corners. Since a 6-foot sidewalk costs about 60 to 75 cts. per lineal foot in most cities, this sum could be charged against sidewalk, and the balance against the sewer. In calculating the economy of this construction, the cost of two sidewalk sewers, with inlets, less the cost of two sidewalks (and curbs, where the sewer serves as this also), should be balanced against the cost of one sewer of the required size in the center of the street, plus inlets and connections of same with sewer. Some allowance might be made for possible cost of opening street pavement to permit of repairing sewer, but such openings are very seldom necessary if manholes are provided.

MUNICIPAL DAY LABOR IN FLINT

Nearly Half Million Dollars' Worth of Paving and Sewerage a Year—Value of Unit Cost Records in Securing Efficiency and Economy.

The city engineering department of Flint, Michigan, has been developing a force and appliances for performing by day labor a considerable part of the work done for the city, and the report for 1916 of city engineer Ezra C. Shoecraft contains figures which apparently show a saving to the taxpayers of nearly \$40,000, as compared with what it would have cost had work done by the engineering department been performed by contract instead. The report also states that the work was completed in a shorter time and at less inconvenience to the abutting property owners, than would have been the case if it had been done by contract; and moreover the work was done in a better way, since the incentive to poor workmanship was done away with. Says Mr. Shoecraft in this report: "As the city does most of its work by day labor, it has been necessary to perfect unit cost records. It has been our hope that by this means the department would be enabled to make greater strides towards putting the work on an efficient and economical basis. It is now possible not only to make a comparison of the quality and cost of the work with similar work in other locations, but to compare the costs of like work performed under foremen in different parts of the city, thus bringing out the strong and weak points of the organization. Records of this kind are invaluable in conducting work under such a department as this.

"Considerable importance is given to this part of the work and we feel that the moral effect on an organization is alone a justification for keeping unit cost records. Aside from this, we are able daily to determine if any part of the work is costing too much, and when such a condition is found there is no reasonable excuse why a remedy should not be applied to the diseased part."

During the year 1913 the value of the work done plus engineering was \$98,000 and the overhead cost was \$6,347. In 1914 the amount of work was increased to \$510,000,

but the overhead cost was only \$7,468; while in 1915 the overhead cost for \$458,000 worth of work was \$7,096. This shows an overhead cost during the last two years of about 1½ per cent of the value of the work done. These overhead charges include not only the regular engineering services, but also the various investigations conducted by the department.

During 1915 the work done included 7¼ miles of paving; most of this was sheet asphalt, but with a small amount of brick and asphalt block; also 21¼ miles of sewers, 7¼ miles of sidewalks and comparatively small amounts of street grading and graveling. The paving work done during 1915 was greatly interfered with by the weather, delays attributed to this amounting to approximately six weeks.

In 1914, when the council determined to do paving and sewer work by day labor under the direction of the engineering department, an asphalt plant was purchased with a capacity of 1,500 sq. yds. of 2-inch surface per 10-hour day, an 8-ton Austin tandem gasoline roller, five 2½-cu. yd. Troy asphalt wagons, and the necessary small tools for laying asphalt pavement. The asphalt plant cost \$9,245, plus \$381 for foundation, \$494 for a kettle shed, \$743 for buildings, \$303 for a fluxing oil tank and \$638 for other equipment at the plant. The asphalt wagons cost \$825, asphalt roller \$2,350. These, together with other expenditures, gave a total initial cost of the plant of \$18,289. Depreciation of this plant is charged off at the rate of 20 per cent for the asphalt plant and minor equipment at the same, asphalt wagons and asphalt roller; and 10 per cent is charged off for the foundation, kettle shed and other buildings and fluxing oil tank. No special equipment was purchased for the sewer work, as practically all of this is hand work.

In the street paving equipment, the road roller cost \$1,200, one concrete mixer \$1,150, and a smaller mixer \$500; and a steam shovel \$3,160. During the year a small gutter and curb concrete mixer was purchased at the cost of \$365. Depreciation is charged off at the rate of 10 per cent on the road roller, the larger concrete mixers and the steam shovel, and at the rate of 20 per cent on the small concrete mixer. The total amount of depreciation allowed on all the apparatus of the department totaled a little over \$8,000 for the year 1915.

Asphalt materials, paving brick, Portland cement, concrete aggregates and sewer pipe were inspected and tested to determine their compliance with specifications. In one case 11 cars of paving brick were rejected. In addition to paving and sewer work, the city has also built several concrete bridges. The city has purchased the gravel rights on a piece of land several miles from the city where the supply of gravel is apparently sufficient to last the city for a number of years.

Although the city does a considerable amount of paving and sewer work, it has not done all of it. During 1915 the cost of paving work done by the city was about \$201,000 and that by contractors about \$34,000; and the sewer work by the city totaled about \$87,000 while that by contractors amounted to about \$82,000.

BRICK PAVING DEMONSTRATION.

The National Paving Brick Manufacturers' Association is arranging for a demonstration, to be given near Paris, Illinois, of the method of laying brick on green concrete, without the use of a sand cushion, in which every step of the construction will be shown. This will probably be given on October 5th and 6th, and a general invitation to be present is extended to all engineers and others interested in road building. Further information will be found among the "News of the Societies."

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CHANGE OF ADDRESS

Subscribers are requested to notify us of changes of address, giving both old and new addresses.

Contributions suitable for this paper either in the form of special articles or of letters discussing municipal matters, are invited and paid for.

Subscribers desiring information concerning municipal matters are requested to call upon MUNICIPAL JOURNAL, which has unusual facilities for furnishing the same, and will do so gladly and without cost.

Our New "Contents" Page.

With the August 24th issue Municipal Journal made a change in the location and manner of presenting the table of contents which it believes will be appreciated by its readers, and which it proposes to continue. Hereafter the contents of the reading pages will be found on the first page inside the front cover. (The contents of the advertising pages will, as heretofore, be placed on the first page inside the back cover.) This will save lost time and annoyance caused by a search for the editorial page, on which it was previously placed.

An additional advantage of this change is that it affords opportunity for making the table more complete. Brief descriptions of the nature of the leading articles will be given; but of special importance is the itemizing of the Week's News. The forty or fifty items presented under this head each week are, we are led to believe, appreciated by all classes of readers, and would seem to deserve greater prominence in the table of contents. Hereafter each item will be listed, giving the nature of the news and the city from which it was reported.

Bituminous Concrete Reservoir Lining.

A few years ago the use of asphalt for lining reservoirs became more or less common, the asphalt being applied to a concrete lining and in some cases held in place by burlap embedded in it. Asphalt or poured paving joint filler has for years been quite commonly used to fill expansion joints between concrete blocks laid as reservoir lining. In 1899 asphaltic concrete was used in constructing the core wall of the East Canyon Creek dam, in Utah, consisting of a 4-inch layer on each side of a wall of vertical steel plates. The use of asphaltic concrete as a surface lining for reservoirs is, however, novel so far as we recall. It is recommended for waterproofing the Cedar river reservoir of Seattle, Washington, as described in this issue.

The general idea is to cover a reservoir bottom of one hundred acres or more area with asphaltic concrete similar to that used for roadway paving (but using a softer asphalt, possibly) and laid and rolled in a similar way, or with a concrete composed "of fuel oil emulsions, or preferably of the heavier asphaltic oils mixed with hot sand, gravel and dust in proper proportions." By the latter mixture city engineer Dimock believes that "a material can be made which shows a greater degree of impermeability than ordinary concrete" and "will possess

sufficient elasticity to adapt itself readily to slight settlements of the foundation and to changes of temperature." These conclusions are based upon laboratory experiments conducted by Mr. Dimock during the past few months. Another suggestion is to form a layer of asphaltic mortar $\frac{3}{8}$ of an inch thick by forcing hot asphalt onto and into the bed of the reservoir and immediately afterward jetting hot sand into this; this construction having been used for roadway paving at the Panama Pacific Exposition.

The use of pavement construction for waterproofing a reservoir hardly seems logical to us, although the recognition of the adaptability to such purpose of the materials used in making impervious road surfaces may well prove a valuable addition to engineering knowledge. But a pavement is intended to resist the pressure and abrasion of heavily loaded wheels, and temperatures varying by at least 100 degrees, in addition to not absorbing water that lies on it in thin films; while a reservoir lining should be water-proof under a head of water of 100 feet or more, but will be subject to much less change of temperature (probably not more than 30 or 40 degrees) except where not covered by water (and the temperature here can be kept fairly constant by covering the asphalt with a foot or more of earth), and need not resist abrasion or local pressures.

The conditions to be met by pavements and by reservoir linings are so totally different that it hardly seems probable that the construction that has proved best for the former will be the most impervious and economical for the latter; and it seems to us as necessary to test the water-proofing qualities under high heads of paving as of the mixture proposed by Mr. Dimock, and that this one essential quality can be secured to the desired degree at a less cost than if combined with the totally unnecessary ones of ability to resist traffic and extreme temperature changes.

Paving the Slum Districts.

Recently and within a day or two of each other, two items were brought to our attention which, although differing in other respects, emphasized the importance of proper paving in the more congested sections of cities occupied by the poorer classes.

One of these items was in the form of information concerning the activities of the Association of Commerce of St. Paul. This association, in re-organizing this spring, created a division of public affairs to be conducted by a staff official under the title of commissioner; Prof. G. A. Gesell of the University of Minnesota being obtained to fill that position. Among the most important work which Mr. Gesell has already accomplished as commissioner, in cooperation with a special committee of the association, was to conduct an inquiry into the conditions in what is known as the West Side flats—a low district along the Mississippi, which had received practically no attention from the city in the way of street grading and paving; water or sewers, and where were located numerous dumps. On the basis of this investigation the association recommended to the city council emergency relief measures to remedy this neglect and it is expected that action will be taken to put these through. Chief among these measures will be the abolition of wells, cesspools, etc., the extension of the water and sewerage systems and the grading of the streets to at least the extent required for draining them. The dumps in that neighborhood and the wagons hauling material to them will be more closely supervised to diminish the nuisance created hereby, and they will be superseded as a playground for children by the establishment of a regular playground to accommodate the 1,200 children living in the district.

The other item referred to was a statement by R. H.

Bishop, Jr., health commissioner of Cleveland, who took as his text the desirability of keeping our cities cleaner as one protection against the spread of infantile paralysis. Among other things, Mr. Bishop believes that every citizen is entitled to clean streets, which implies, of course, streets which are capable of being cleaned. "There appears to be no just reason," said he, "why the best paving should be provided for the streets of the well-to-do or why these streets should receive the major attention from street cleaning departments. From a sanitary standpoint it would be much better to discriminate on the other side if there is to be any discrimination at all.

"The poorer portions of any city are more crowded. There is little or nothing in the nature of dooryards, so the street is the place where children play and older people congregate in their spare time. Congestion increases the normal refuse that may be expected in a populated region. It is in such localities that we find the cobbled, cracked and rutted pavements which defy the best efforts of the street cleaner and which often, perhaps through discouragement over results, the street cleaner so nearly neglects."

Mr. Bishop states that warfare against the infantile paralysis germ cannot be successfully prosecuted merely by sweeping such a pavement; but that the streets should be built with a uniform, non-adhesive surface which can be and is washed perfectly clean by flushing at frequent intervals. If the objection be made that, with such paving, property along the street would increase in value and rents would rise, his reply is that if all streets were paved in this way this would not be the case. "Dr. Gorgas' work in Panama became effective only after grouted brick pavements had been laid upon practically every street in the city, thus establishing a basis for public cleanliness. It seems to me that many American cities can learn for themselves what the United States has already taught the tropics."

There can be little question that the conditions referred to in both of these items, and the desirability of remedying them, are applicable to a great many if not most of the cities of the country. The part the street plays in the life of citizens generally has not been sufficiently considered. It serves not only as a thoroughfare, but also as an open space for the admission of light and air and in many sections as a substitute for a park or other breathing space for adults and a playground for children. This has been realized in a number of the larger cities, as by the action of the officials in New York city, who have set apart certain streets as playgrounds for children during certain hours of the day, at which time no teams are allowed thereon; and by the recent report of the building restriction committee of that city, which gave, as one of the arguments for completely excluding business streets from certain residence sections, that the streets of the latter would then become safer playgrounds for children. Nothing is more certain than the moral effect of cleanliness and tidiness or the reverse. Only the most untidy of citizens will be found throwing paper or rubbish onto a sidewalk or roadway which is clean and free from any litter; but allow more or less litter or dirt to collect on a street, and few citizens will think it necessary to refrain from adding their small quota to the accumulation. Consequently, it would appear to be both hopeless and illogical to expect inhabitants of the poorer and more congested sections of the city to refrain from throwing papers, ashes and all sorts of refuse into the streets when the city neglects to maintain them in at least a fairly clean condition.

As Dr. Bishop has stated, maintaining a clean street requires that such street be given a pavement which can be kept clean. He refers to the rough and rutted pave-

ments, but we can refer him to congested sections of many cities which have no pavements at all, but where one could find, in hot weather, pools of stagnant water containing garbage and refuse and covered with a green scum—streets which cannot possibly be cleaned and which, in fact, it would be difficult to do anything whatever to in the way of cleaning. Such streets it would certainly be desirable to supply with a smooth pavement as a health measure if for no other reason. And as health is quite generally given first place in the consideration of municipal officials and organizations, and "safety first" is being accepted as a working basis in every direction, it would seem as though such improvement may be hopefully anticipated in the near future.

A smooth pavement does not necessarily mean an expensive one or one capable of supporting heavy traffic. Grouted brick pavements on a thin concrete foundation or on a natural gravel soil, or thin sheet asphalt on either a concrete foundation or an old brick or block one, bituminous concrete or bituminous macadam, all can be cleaned by the use of the street flusher, which will remove all the dust after the litter and other larger matters have been removed by brooming. In the "slum" districts, if nowhere else, it would seem desirable that the city forces clean the sidewalks also, which sidewalks should therefore be paved with concrete or other smooth and washable surface from building to gutter. The washing of the roadway by the flusher can then be supplemented by a daily flushing of the sidewalks by hose.

The paving of all such streets would undoubtedly entail considerable expense upon the city, but it could be claimed with considerable justice that the city owes it to its poorer citizens to take these measures for their protection. The cost can be greatly reduced by narrowing the roadway to 20 feet or possibly 25 feet, except on such streets as are naturally thoroughfares. This narrowing of the roadway will not only reduce the cost but will also, by widening the sidewalks, afford larger areas where the children can play and their elders assemble without incurring the dangers of the roadway, and will also tend to restrict the amount of unnecessary traffic, which should use thoroughfare streets, and thus enable a less expensive pavement to meet the requirements.

SEWAGE TREATMENT UNDER CITY STREETS.

The suggestion made some years ago that the sewage of Manhattan Island, New York, be treated in a number of relatively small plants located under the streets at frequent intervals along the east and west water fronts, was at the time considered more or less of a joke by a good many people. It seems probable now that the general idea will be adopted, at least for some sewer outlets. In fact, bids are now being asked for constructing a sewage treatment plant at the foot of Dyckman street, in connection with an outlet sewer at that point. Only the "removal of suspended solids from the ordinary dry weather flow" is aimed at. Bids are asked on Reinsch-Wurl screens, Imhoff tanks, and sedimentation tanks with separate sludge digestion tanks; each combined with grit chambers. "Either of the plants mentioned will be satisfactory to the city," says the notice to bidders.

A generation ago, an acre for every thousand people (as a general average), which was required for intermittent filtration, was the smallest area which could be used with any approved method of treatment. The possibility of placing treatment plants in short lengths of city streets is due not more to improvements in methods than to changes in aims; for the effluents from plants such as those contemplated for New York may contain ten times as much organic matter as those from good intermittent filters, and yet be considered satisfactory.

SALE OF WASTE MATERIAL

Many Waste Materials Increasing in Value—Kinds in Demand—Instructions for Grading

Until recently very few cities have realized anything from the large amounts of saleable refuse which is collected from or destroyed by their citizens. The larger cities, however, have found that considerable sums may be realized from the proper collection, sorting and sale of many kinds of city waste materials and have either arranged to do such sorting by their own employees, or, what is more common, have granted the privilege of such sorting and sale to private parties for an annual consideration. It seemed, however, that the overhead costs of this work and the comparatively small amount of material collected did not justify smaller cities in endeavoring to market their waste materials, especially in view of the fact that in the smaller cities not only the total amount of refuse which is collected, but even the amount per capita is very much less than in the larger ones, more being burned or otherwise destroyed by the citizens.

Recently, however, the value of these waste materials has greatly increased. One reason for this is that about one-half of the rags and papers used in this country for manufacturing paper have heretofore been imported from other countries, but during the past year or two (owing largely to conditions growing out of the war) the material secured from abroad has very greatly decreased, several foreign governments having forbidden the export of paper-making materials to other countries. This has resulted in a much greater demand for these materials and a resulting increase in the prices which they bring. At the present time the United States produces daily more than 15,000 tons of paper and consumes for this purpose old papers to the amount of about 5,000 tons. It is stated that rags form 7.8% of the fibres used in paper making; waste papers, boxes, magazines, etc., 21.4%.

In 1913, when conditions were comparatively normal, we imported about 123,000 tons of rags and 380,000 tons of waste papers.

Under these conditions it behooves the officials of cities and towns who have at heart the financial interests of their communities to consider whether their incomes may not be increased to some extent by the collection and sale of the many classes of refuse which find a ready market. In a recent bulletin upon this subject, the Department of Commerce gives the following as materials for which there is a demand:

Clean white cotton or linen rags and clean unbleached cotton and linen rags are always in demand. Scraps and small pieces are just as suitable as much larger pieces. The finest grades of paper are made from such material and the demand for such rags is always steady.

Cuttings from fancy shirtings, table damasks, toweling, cotton and linen dress goods, etc., are in demand and are readily sold.

Soiled white rags, both new and used rags, enter into the composition of a very large variety of high-grade white and colored papers.

Soiled and dirty colored rags, known to the mills as "thirds and blues," except the black and dark-red colored ones, make up the largest amount of any single grade of rags used in the manufacture of high-grade book papers and medium-grade writing papers. In this class is included old canvas, awnings, sailcloth, and all kinds of soiled rags. No light-colored rag is too dirty to be used, as the manufacturing process converts the dirtiest rag into a white mass, whiter than the original cotton from which it was made.

Black rags, especially old black stockings, are in general demand. They are used in producing black papers and especially for mixing with lighter-colored paper stocks, thereby producing the effect known as granite papers.

Woolen rags of all kinds are of value; the higher grades are returned to the woolen mill for remanufacture, while

the lower grades are in demand for manufacture into roofing papers or roofing felts.

Attention is especially called to the wide range of uses for which rags and old papers of all kinds are available. All grades should be saved, as the rag packer and the paper maker will find a use for them. The highest grades will go into the higher grades of paper, while even the lowest grades of this waste material can be made into box board. The product known as box board is an excellent substitute for wood used in the manufacture of wooden boxes, and when made into shipping containers it is fully as strong and very much lighter than the wood which it replaces. The saving of this material, therefore, produces a new superior product and at the same time conserves our forests.

White clippings and shavings from book papers, bond papers, ledger papers, and writing papers are especially valuable, and a steady demand for such material is always found.

Printers' waste, consisting of paper damaged in printing, paper used to clean ink from the inked forms and rollers of printing presses, and other soiled printing waste, is available for remanufacture into many different grades of paper.

White and colored writing papers are suitable for remanufacture into many other grades after the ink and coloring matter are removed.

Clean wrapping papers of all kinds are valuable for remanufacture into similar grades.

Old books, magazines, periodicals, account books, etc., can be remanufactured into book papers of excellent quality. All material of this kind that is saved is of direct benefit to the forests of the country, as magazine and book papers are very largely made from wood pulps.

Clean folded news paper is suitable for a number of paper products and is in demand.

All grades of cardboard, strawboard, corrugated box board, and soiled wrapping papers, newspapers, etc., are suitable and in demand for remanufacture into cardboard required to make containers for packing crackers, cereals, and other food products. The process of remanufacture is such that the material used is thoroughly sterilized. The demand for clean food products requires that all old papers must be saved.

Burlap bagging and manila rope are also of value in the production of strong wrapping papers, and the supply of this material is always less than the demand.

If these contain no fruit skins or other vegetable matters, glass, crockery or other materials which would be useless or injurious in connection with paper making, it will not be necessary to sort them, as the sorting can be done by junk dealers or others to whom the material is sold. If there are large quantities, however, it may be preferable for the city to do its own sorting, as the prices then received are considerably higher. If it is not sorted beforehand, the material can be sold to the Salvation Army or certain other charitable organizations, or to dealers in junk and rags which may be found in the large cities in all sections of the country.

If a partial sorting is attempted, it is recommended that the following grading be made: Separate rags from old papers. Separate folded newspapers from all other waste. All books and magazines from all other waste, tying them into bundles for convenient handling. Provide bags for the rags, placing nothing else with them; and keep all waste papers other than newspapers and rags in bags, barrels, bundles or bales. Keep all collected waste material dry, as mildewed papers and rags are of little value.

If it is desired to still further grade the rags, these may be divided into clean cotton and linen rags; soiled cotton and linen rags, including old canvas, awnings, etc.; woolen rags and old woolen cloth; burlap bagging. Paper may be further sub-divided into the following classes: White and colored waste papers from office desks, etc., not including newspaper, wrapping paper and cardboard; clean folded newspapers; clean wrapping paper; mixed papers consisting of soiled news and wrapping papers, box board, etc.

Papers kept loose occupy an enormous amount of space,

and are very dangerous as fire risks. It is therefore desirable that the paper be compressed into bales daily or at frequent intervals. Well-pressed bales of paper will not blaze but will only smoulder; they are much easier to handle than the loose paper, are more readily saleable, and can be shipped for about one-third of the freight charges for paper loosely packed in bags.

LOW COST ROADS FOR MODERATE TRAFFIC*

How New Hampshire Builds Gravel Roads for Less Than Four Thousand Dollars a Mile—Staking Out Roads.

Any kind of pavement of the so-called permanent type costs from \$10,000 to \$30,000 per mile, and many engineers and road commissioners are confronted with the question of how the mileage necessary to complete their highway system can be built without bankrupting their state or county. High class types of surface are undoubtedly essential on trunk lines or main roads between cities or county seats, since they are subjected to all sorts of traffic, both horse-drawn and motor. But outside of these main arteries it seems necessary to construct a cheaper type of road. For such roads I say emphatically that it is economy to construct a less expensive type than bituminous macadam, concrete or brick; and to illustrate this I will give a sketch of the methods employed in the state of New Hampshire.

In 1904 Arthur W. Dean, now chief engineer of the Massachusetts Highway Commission, was made the first state engineer, and through his efforts a comprehensive plan of state aid for road construction was worked out, and put into effect the following year. This plan left the selection of roads to be improved largely to the several towns, and the result indicated the necessity of a change in procedure, and in 1909 the legislature authorized the designation and construction of three main north and south lines.

At the outset, the principal obstacle was the cost of constructing a good class of highway. Many citizens were horrified at the thought of spending \$5,000 a mile for road improvement, for this was more money than the majority of towns in the state expended on their entire road mileage. Moreover, most of the towns of the state are isolated from the railroad or at such a distance from stone quarries as to make the macadam road prohibitive. We could have made but a poor showing on any one of the three roads leading north and south through the state with the funds available had we been obliged to confine ourselves to a high class of construction. Instead, we used the material at hand. In a number of localities there are deposits of good gravel, and here we have obtained good results with comparative ease. In a number of localities, however, gravel is entirely lacking or is of inferior quality, and under these conditions we resort to a combination of materials. If the gravel is sandy with no binding material, we alternate the layers of gravel with clay or marl, or sometimes mix the two materials thoroughly by harrowing. If there is not enough metal in the gravel, we have found that, with a stone foundation, material of a very inferior quality can be used for surfacing with very satisfactory results.

In parts of the state is found a mixture of clay, sand and gravel called hard-pan; this probably being more common than any other native material. This when

mixed with sand or sandy gravel, or even laid directly on a stone foundation, gives good satisfaction under our system of maintenance.

In laying out the road, contrary to the general practice, we do not make a plan of the road first, but our first procedure is to establish the center line of the new road on the ground, correcting the old alignment where possible. With this as a base line, we stake out a new lay-out and also make a survey of the existing conditions. Stakes are set every 50 feet on an offset from the center line. When the cross-sections are taken, elevations are obtained of the tops of these offset stakes, so that when the finished grade is decided upon it is easy to determine the cut or fill from the top of the stakes. If for any reason it is desired to change the alignment after the survey is plotted on the plan, the stakes are on the ground and it is an easy matter to figure the offset either way from them. This method of survey and staking out saves the expense of one engineering operation in the field.

The essentials of drainage and foundation are given particular attention, for with a gravel or dirt road it is very necessary that the water be thoroughly taken care of. Many of the roads are given a telford foundation, especially if the gravel is of an inferior quality with a tendency to be heavy or sticky in wet weather. An abundance of rock which can be used for telford is found scattered quite generally throughout the state.

Most of the roads are built 21 feet wide from ditch to ditch. In some cases I am inclined to think that this is not wide enough, although the roads have answered very well for the traffic they are subjected to. The original specifications called for 15 feet of metal and a 3-foot dirt shoulder. The gravel was laid in three courses of such thickness that the whole compacted mass was 8 inches. Today we believe that we can get better results by sub-grading the entire width of 21 feet in practically a flat section, although if a stone foundation is used we crown it slightly. On this the surfacing material is placed in two courses, the loads being dumped on dumping boards or in such other way that all the material will be handled over.

We desire to roll each layer, a horse-drawn corrugated roller being used in most cases. Some of the larger towns, however, use a steam roller, and some of the smaller ones have no roller and depend upon the traffic to do the packing, keeping it in shape by dragging and raking. Of course, quicker results are obtained where it is possible to sprinkle and thoroughly wet down the separate layers, but in most cases we must depend upon nature for the wetting. The finished section has a thickness of metal of about 10 inches in the center and practically nothing at the edges. This gives a crown of about 1 inch to the foot, which we believe is necessary for roads of this nature.

During the 10 years' life of the department it has built 1171 miles of road outside the settled portions of towns having a population of over 2,500, of which 558 miles is trunk line. Of the trunk lines, 422 miles is gravel construction which cost an average of \$3,826 per mile.

Gadsden's Water Works Statistics.

Our attention has been called by R. A. Polglaze, superintendent of the Waterworks Department of Gadsden, Ala., to the fact that an injustice was done that city through the unusual coincidence of two printer's errors, by one of which that city was credited in our waterworks table of June 1st with 20 5/8-inch meters, when the number should have been 200; and again in the table in our June 15th issue, the length, cost, etc. of pipe laid which was attributed to Dothan, Ala., should have been credited to Gadsden, Dothan having laid no pipe during the year 1915.

*Abstract of paper before American Road Builders' Association by Frederick E. Everett, State Highway Commissioner of New Hampshire.

The WEEK'S NEWS

State Roads in Kentucky—Good Roads Days Successful—City to Have Gateways—Sewage Disposal to Be Enforced—
 Poliomyelitis on Decline—Chlorination of Water Supplies in California—Asks Court's Aid for Water Supply—
 New York Wants Municipal Light Plant—New Jersey 90-Cent Rate to Supreme Court—Police Force to
 Strike—Black Tom Verdict In—Two Platoons for Sacramento—New York's Municipal Garage—
 Tax Difficulties in Maryland—Cities Collect Garbage—Race Segregation in Dallas.

ROADS AND PAVEMENTS

State Roads in Kentucky.

The second biennial report of the State Road Commissioner, covering the period from November, 1913, to November, 1915, has been issued, showing that in the period over a thousand miles of roadway were surveyed for construction, consisting of 471 miles of macadam reconstruction, 259 miles of macadam new construction, 179 miles of graded earth construction, 77 miles of gravel, 26 miles of bituminous-bound and 22 miles each of concrete and brick. The estimated cost was \$2,057,162.06.

Good Roads Days Successful.

Birmingham, Ala.—Good roads days, Aug. 14 and 15, were generally observed throughout the state. It is estimated by the Alabama Good Roads Association, after receiving reports from many counties in the state, that not less than 100,000 men worked the roads in Alabama during these two days. Madison and Tuscaloosa counties seem to have aroused the greatest enthusiasm among the people of those counties and men of all classes took part in the road work. Reports from Tuscaloosa show that many miles of roads were worked, and that much good was accomplished. Throughout the Tennessee valley the reports indicate that the people entered into the spirit of the occasion. In Jefferson county it is estimated that not less than 2,000 men worked the roads. The reports from south Alabama show that the people took advantage of the occasion to repair the damage done recently by the heavy rains and floods. In Greene, Dallas and Wilcox counties, the government furnished relief funds for negroes to work the roads and hundreds of them took advantage of the occasion to make the daily wage. Throughout the state the first legalized good roads days were in every way a success.

\$1,000,000 for Roads in National Forests.

Washington, D. C.—Tentative allotments of a million dollars for construction and maintenance of roads and trails in national forests, has been announced by Secretary Houston of the Department of Agriculture. This would be expended during the present fiscal year out of the \$10,000,000 appropriation by the federal aid road act. Under the terms of the act the states were required to co-operate to the extent of 50 per cent of the estimated cost of surveys and construction. Tentative allotments to the principal national forest states follow: Alaska, \$46,280; Arizona, \$59,795; Arkansas, \$11,294; California, \$140,763; Colorado, \$62,335; Idaho, \$108,010; Montana, \$69,901; Nevada, \$19,195; New Mexico, \$42,622; Oregon, \$127,794; South Dakota, \$8,115; Utah, \$40,982; Washington, \$91,739; Wyoming, \$40,566. In addition, \$9,552 has been tentatively assigned to Florida, Michigan, Minnesota, Nebraska, North Dakota and Oklahoma, while the eastern states—Maine, New Hampshire, Virginia, West Virginia, North Carolina, South Carolina, Tennessee and Georgia—in which the government is purchasing lands for national forests have been allotted \$21,057.

Begin Work on Colorado Concrete Highway.

Denver, Colo.—Work has been started on the first link of the concrete highway between Denver and Golden. This section extends from Sheridan boulevard on West Colfax for four and eight-tenths miles. It will be eighteen feet wide and will cost \$65,000. November 1 will see the completion of this stretch of road. The Denver-Golden

road will be nine and eight-tenths miles and cost \$160,000. Grading on the second stretch of five miles which will complete the highway as planned has been delayed by the presence of the Colorado National Guard mobilization camp at the Golden rifle range, which is located on the right of way. State Highway Commissioner Ehrhart has made arrangements with Adjutant General Gamble for the accommodation of the troops so that work may start on this part of the highway September 1. It is thought, however, that the entrainment of the soldiers for the border, which is expected soon, will leave the situation clear for early commencement of this work in any event.

City Gateways for Albany.

Albany, N. Y.—Albany architects have been invited to submit designs for two artistic gateways, one to be placed on the Schenectady road and the other on the Loudonville road at the city lines. Each entrance must be designed to cost not more than \$1,500, as the committee of the Albany Automobile club and the Chamber of Commerce which is backing the project has only about \$3,000 at its disposal. Each architect will be allowed to submit two designs, it being optional with the committee whether it shall erect entrances of different types. The committee to which the designs will be submitted consists of Mayor Stevens, City Planner Arnold W. Brunner, City Engineer Frank R. Lanagan and Commissioner of Public Works Wallace Greenlach.

SEWERAGE AND SANITATION

Epidemic Started Through Delayed Letter.

Watertown, Mass.—The fact that an official notice mailed at East Watertown on August 5 did not come to the notice of the Board of Health in its office, slightly more than a mile away, until ten days later, is given as the reason for the spread of an epidemic of diphtheria in the east end of Watertown. The outbreak has assumed such proportions that one section of the town, including over 2,000 people, is quarantined, fifteen special policemen have been sworn in to guard the quarantined district, every available doctor in town has been summoned to help fight the disease and a specialist, Dr. Edward J. O'Donahue, from the health board of Boston, has been placed in charge of the work. There were already 25 cases when this action was taken. On Aug. 5 a doctor was called to a house to treat a case of diphtheria. He immediately mailed to the health board a printed notice as required so that no time might be lost in establishing a quarantine of the house. Ten days later this letter was found, unopened, in the office of the board of health. The postmark plainly showed on what date it was mailed. The health officials declare the letter could not have been delivered and the officials of the local post office are of the opinion that it was delivered on time and was overlooked in the health office. A strict inquiry has been started.

Sewage Disposal May Be Enforced.

Youngstown, O.—Whether or not the town of McDonald, being laid out by the Carnegie Steel Company in connection with the site of its new McDonald mills just above Girard on the banks of the Mahoning River, will have a sewage disposal plant and system of its own or will go without such an arrangement until such time as Youngstown, together with the smaller towns both above and below it, decides upon a comprehensive sewage system, is the ques-

tion now confronting the steel company's engineers and those of the state board of health.

At the conference in Columbus Monday, at which City Engineer F. M. Lillie was in attendance, a plan of sewage disposal to take care of McDonald alone was presented by the Carnegie engineers. It met with the approval of the state board in itself, but it was the opinion of the state engineers that a general plan, centered in Youngstown and including East Youngstown, Struthers and Lowellville down the river and Girard, McDonald, Niles and Warren up the river, would be a better one. Many months ago the state board ordered Youngstown to prepare plans for some such system, as present methods are declared to be unsatisfactory from health standpoints. The city, however, has done nothing in the way of following out these orders. It is believed possible that the state board will now hold up the McDonald plan temporarily and insist upon its former orders being carried out. It would consume considerable time to plan and put in operation a system including the territory mentioned, but its value to the whole district when completed would offset the delay and expense, the board believes.

Poliomyelitis Decreasing in New York.

New York, N. Y.—Figures for new cases of infantile paralysis continue to show marked decreases in the spread of the disease in all boroughs of the city. Two weeks ago there were almost twice as many cases reported daily as at present and the number of deaths has dropped sharply with the passing of the period of high temperature and humidity. Up to August 30, the number of deaths in New York City was 1,889 and the total number of cases 7,904. No reason for the epidemic has yet been discovered and it is difficult to trace any relation between heat, humidity and disease, though on the charts in the Health Department offices the days of high humidity showed a sharp rise in deaths. Experiments are being continued with serum and the need for the blood of immune persons has greatly increased, due to the diminishing number of volunteers and the growing number of cases where results are promised from its use.

Anti-Typhoid Treatment After Flood

Huntington, W. Va.—Six thousand five hundred anti-typhoid serum treatments have been ordered by the state authorities for use in inoculating persons living in the Kanawha valley, who were exposed to the disease since the cloudburst which swept the valley and left large sections under water. Other orders will be placed immediately, and all persons living in the flood-swept section will be given the three injections of the serum, if the state health officers' plan is carried out. Members of the West Virginia national guard were encamped at Ronda, where flood relief headquarters were established. The men worked under the direction of Mayo Tolman, state health officer.

State Sanitary Engineer Makes Many Improvements.

Charleston, W. Va.—Personal investigation of the water supplies and sanitary conditions in nearly a hundred different cities, towns and villages in West Virginia, securing a material improvement of conditions, including the installation of at least fifteen chlorinating plants for the purifying of water supplies, was accomplished in the last twelve months by Mayo Tolman, the state's first sanitary engineer, with the department of health, according to his preliminary report for the year just made to Commissioner S. L. Jepson. Mr. Tolman's investigations covered water works systems, sewage disposal, typhoid outbreaks and their causes, nuisances due to back-water from rivers and small streams, the sampling of water and milk supplies and their analysis, pollution of streams which furnish water supplies, and the sanitary control of dairies, slaughter houses and other enterprises. In addition to this work the division of sanitary engineering has taken charge of the sampling of all public water supplies in the state. This meant the designing of a suitable container for shipping bacteriological samples over long distances. This department, in co-operation with the public service commission, has required every public water utility in the state to own and use these containers. Mr. Tolman recommends the employment of additional engineers to take care of the demands which are being made on his division of the health service. In out-

lining the work for the coming year Mr. Tolman plans to investigate all of the 104 public water supplies of the state which have not been inspected; make a study of a number of sewage disposal plants; investigate mining sanitation; examine the conditions of air in many of the railway tunnels of the state; investigate Kanawha river pollution, and make special surveys of various insanitary conditions.

WATER SUPPLY

New Filtration Plant in Operation.

Louisville, Ky.—The new filter plant at the reservoirs on Silver Hills, New Albany, has been put in operation and filtered water is now passing into the mains. The plant, which was installed by the New York Continental Jewell Filtration Co. of New York, under the direction of Charles Harding, engineer, and the supervision of J. O. Endris, Jr., engineer for the water company, cost \$100,000.

Municipal Waterworks Shows Surplus.

Beaumont, Tex.—The quarterly report of the waterworks commission for April, May and June, shows that the plant netted \$10,565.72 above all operating expenses during that period. The report further showed that after deducting the amount necessary for the interest and sinking fund to take care of the \$500,000 bond issue voted to buy and improve the waterworks, the city still had a net profit of \$1,406.88. This shows the plant is not only paying for itself, but is actually adding money to the city's treasury. Total operating expenses of the waterworks for the three months were \$8,771.53, while the gross earnings amounted to \$19,337.25, leaving a gross earning of the amount given above, \$10,565.72. After taking from this the \$9,158.84 necessary for the interest and sinking fund, there is left a net earning of \$1,406.88.

Chlorination of Water Supplies in California.

Sacramento, Cal.—Chlorinated water is being used in many cities in northern and southern California, a million people being supplied with it, according to estimates of the state board of health. The board has recommended and sponsored the use of this method of water purification. Among the cities that have recently adopted this method are Los Angeles, Oakland, Sacramento, San Diego, Pasadena, San Jose, Eureka, Antioch, Benicia, Auburn, Pittsburgh, National City, La Mesa, East San Diego, Santa Barbara, San Luis Obispo, Monterey, Redding, Merced Falls, El Centro, Berkeley and Alameda. In addition, public swimming pools in Oakland and San Francisco are also chlorinated. One of the most striking examples of the efficiency of chlorination in purifying water is reported by Sacramento. In 1914, before chlorinating the water supply of that city, there were 253 cases of typhoid fever, while during the first six months of 1916, since the purification system has been installed, there were but eight typhoid cases reported. Forty chlorination plants are reported as already installed in Oregon, Washington, Arizona, Utah and New Mexico, while twenty-nine plants are now in service in California.

Fear Test of Intake Pipe.

Sandusky, O.—City and state authorities fear danger in the 700 feet of underground pipe laid from the water works pumping station to the bay shore to connect with submarine sections in the new 45-inch intake pipe. This fear is so pronounced that foreman Ames, employed by the contractor and engineer Waring, of the state board of health, have refused to enter the land work pipes to make an inspection. City engineer Johnson, instructed by the city commission to pass upon the permanency of the work and its adherence to contract specifications, says he is willing to face the possible danger, but has been unable to find another city employe or official who will accompany him. The commission suggested that a second man be on the inspection job so that an accurate comparison of findings could be made. It is thought that hydraulic pumps, now employed to keep water from flooding the pipes, might develop trouble and be unable to hold back the flow. This is said to have caused Waring, of the state health board, to abandon any idea of an inspection after he had come here for that express purpose. The new intake pipe was ordered laid by the state

health board and engineers from that office are expected to pass upon the work along with city officials. No effort will be made by the city to conduct an "eye witness" test of the submarine work. Joints in this line will be tested by a high water pressure. The intake pipe work is practically finished. A bond issue of \$45,000 was authorized to pay for it, and although the contract was let at considerably less than this figure, exigencies have occurred that are expected to use up the larger sum.

Asks Court's Aid for Water Supply.

Struthers, Ohio.—The village of Struthers has obtained a temporary injunction from Common Pleas Judge P. W. Barnum restraining the Mahogany Valley Water company from supplying water to people outside the village until the village is given an adequate supply. The village contends, in its application for a restraining order, that the company's franchise provided that it must supply Struthers first and that the people of the village are not receiving an adequate supply. The temporary injunction will be in force until that case can be heard on its merits.

STREET LIGHTING AND POWER

Borough to Buy Light Plant.

Monaca, Pa.—Action for the purchase of the Monaca Electric Light Company's system has been taken by the borough council, which has an option to purchase. However, if this option is not exercised before September 3 of this year, the franchise of the light company is extended for a period of three years. H. O. Swoboda, of Pittsburgh, an expert electrical engineer, who was secured by the borough to make an appraisal of the property of the light company in the borough, has reported in detail. He said the borough could purchase the plant and operate it at a profit and recommended that the council do so. An offer of \$7,500 has been made the company for the plant and the matter has been placed before the Public Service Commission by the borough solicitor.

New York Commissioner Wants Municipal Light Plant.

New York, N. Y.—Commissioner Williams of the Department of Water Supply, Gas and Electricity, is to insist on repeating before the Board of Estimate his request for \$300,000 with which to establish a municipal electric lighting plant in the Thirtieth ward of Brooklyn. Commissioner Williams states that the contract the city has with the Kings County Lighting Company of Brooklyn for street lamps in the Thirtieth ward would expire next month, and that unless the Board of Estimate agreed to his proposition this contract would have to be renewed for another year. He says the city's contract with the Welsbach company for furnishing the mantles in the Thirtieth ward expires at the same time. The commissioner is of the opinion that he can save the city thousands of dollars in the Thirtieth ward alone if he is permitted to go ahead with his scheme. At a previous meeting of the board, when Commissioner Williams made his proposal, borough president Pounds, of Brooklyn, was very vigorous in his opposition to the scheme, which he denounced as "revolutionary." The proposition involves municipal operation only to a limited degree as it is intended to purchase current from the Brooklyn Edison company for supplying the street lamps.

Fight Canadian Government Power Plant.

Niagara Falls, Ont.—D. L. McCarthy, attorney for the Electrical Development company, has filed an application with attorney general I. B. Lucas for a fiat enabling the company to bring proceedings against the provincial government and the Hydro-Electric commission. This application is the first step in an attempt to block the Hydro-Electric commission's plans for the diversion of water from the Niagara river above the falls, and the construction of a canal from the point of diversion to Queenston where a generating plant would be erected. The plaintiff's claim is that the Hydro-Electric commission has not the legal right to construct the contemplated plant, and that

water diversion by the government would be a violation of the agreement between the power companies and the Queen Victoria Park Commission. Mr. McCarthy also contends that the proposed acts would be ultra vires of the government because the international boundary waters treaty act limits the amount of water which may be diverted from the Niagara river for power purposes. The treaty act is binding upon the legislature, but nevertheless the Niagara development act and the water powers regulation act of 1916 purport to authorize a violation of the treaty act. The complaint states that the legislature has not jurisdiction to confiscate for the benefit of the province the property of any person, that the acts in effect purport to confiscate an asset of the company, whereas the company carries on an understanding extending beyond the limits of the province, and is not liable to be discriminated against by the provincial legislature, and that the acts purport to authorize works which will interfere with the public right to have navigation and fishing unimpeded by artificial works, which public right is subject only to the legislation of the Canadian parliament.

New Jersey 90-Cent Rate Case to Supreme Court.

Passaic, N. J.—City counsel Albert O. Miller, Jr., has received notice from Washington that the appeal of the Public Service Gas Company in the 90-cent gas case has been set down for argument in the United States Court at the October term. The case is the appeal of the corporation from the victory won for Passaic by George L. Record and Dr. Miller in the famous Passaic gas case. The New Jersey Supreme Court found in favor of Passaic and the state board of public utility commissioners which issued the order for the reduction to 90 cents on Passaic's petition. In the court of errors and appeals of the state the supreme court was reversed, but Mr. Record succeeded in having the case reopened and the high state court then reversed itself and found for the people. In the present appeal the city of Passaic and the State Board of Public Utility Commissioners are made co-defendants. Passaic also has an appeal before the Supreme Court of the United States on the point it lost in the big fight—the including of a large sum as going concern value which was allowed by the utility commission. The case is one that concerns the entire state. A number of municipalities are now contributing to the cost of the litigation.

FIRE AND POLICE

Police Force to Strike.

Sherbrooke, Que.—The police force here, whose requests for higher pay recently were refused by the city council, today decided to strike. The council, in militant mood, retaliated with a threat to raise an amateur force. The opening of the Sherbrooke fair, during which the city is crowded with thousands of visitors, has been chosen to inaugurate the strike. At present the police receive \$13 for a seven-day working week.

New Alarm System Accepted.

Wilmington, Del.—The city council has inspected the new fire alarm and police reporting system just installed by the Gamewell Fire Alarm Telegraph Co., New York City. The new system, which cost \$17,000, has been accepted by the city and is now in service. The system is complete and covers the city thoroughly. One feature of the arrangements is that it is possible to send in a fire alarm from any box in the city from the police station.

Black Tom Verdict In.

Jersey City, N. J.—The Lehigh Valley Railroad and the National Storage Company were censured in the verdict of the jury in Coroner Charles Hoffman's court, which completed recently its inquest into the death of Policeman John Doherty, who was killed by the explosion on Black Tom Island on last July 30. After finding that Doherty had come to his death in this way, the verdict continued: "The said explosion was caused by fire, and we censure the Lehigh Valley Railroad, the lessee, and the National Storage Company, as the lessor, for their grave lack of

fire precaution when such dangerous commodities as dynamite, powder, and loaded shells are awaiting shipment in such close proximity to the dwelling places of millions of human beings." Assistant Prosecutor James W. McCarthy, who conducted the inquest, said indictments would be asked at the session of the September Grand Jury for manslaughter in the cases of the responsible officers of the companies, and for maintaining a nuisance in the cases of the directors of the companies concerned.

Two Platoons for Sacramento.

Sacramento, Cal.—Provisions for the two platoon system in the fire department have been adopted by the board of freeholders. Those who favored the system, including chief Anderson, declared that the increase would be less than \$2,000, with a much larger decrease in insurance rates. Opponents of the system asserted that it would increase the city's tax rate and that Sacramento is not large enough to maintain it. Those in favor declared that it would increase the efficiency of the force and would eliminate \$13,000 in salaries paid to call men and \$38,000 annually paid to firemen on vacations, lay-offs and the like.

Card Index Police Work.

New York, N. Y.—Every policeman must now record on cards the arrests he makes, and the accidents and other events which occur on his beat while he is on duty. The policeman gathers all the information he can about the occurrence, jotting his facts down in his loose-leaf notebook. On reaching the station house he receives from the lieutenant a card with a printed form designed for that type of situation, asking for all pertinent facts in detail. He is obliged to fill out the card in ink, and to return it to the lieutenant. The latter examines the card closely to see that the patrolman has not failed to supply any of the necessary data. The card is then sent to the Bureau of Statistics at police headquarters. This bureau is in charge of Mills E. Case, secretary to the police department. Mr. Case has twenty-two men who assist him in compiling and recording the cards. His assistants examine each card carefully for errors. If a card is not perfect it is sent back to the precinct. In recording and indexing the cards the bureau uses a numeral code. Every fact in an accident and arrest is converted into a number. In doing this the bureau uses cards filled with numerals and printed data, and in compiling its statistics of the events the numerals representing these facts are punched by an electric punching machine. This card system is helping the department solve many of its problems. The records of the cards, for instance, show that all diagonal street crossings are dangerous, that few children are injured on their way to or from school, and that very young children are more often injured by horse-drawn vehicles than by automobiles. The arrest cards also disclose interesting and helpful facts. Until the bureau was established there was no way of finding out the final disposition of many cases. Now when a person is injured in an accident the cards follow his case to his recovery or death. In cases of arrest the case is also followed to its final disposition. The bureau handles on an average of 2,000 cards a day, and in the summer months sometimes handles from 6,000 to 8,000 cards a day. The basic idea of the system is to so record and classify all police activities that the department may be able to have a complete record of any case available at any time, and to be able to study by means of the cards different police problems. Different colored cards are used by the department. Arrest cards, for instance, are white, complaint cards of robberies, yellow; green cards are used for highway accidents. The cards are taken to police headquarters by policemen from the precinct. Sometimes they are conveyed there by a policeman from headquarters who is known as the mail carrier. He travels in a small green automobile, visiting the different precincts, leaving behind him police mail and papers, and taking with him the correspondence from the precincts destined for headquarters. Many cases which were entered in the station house blotters are now only entered on cards. The lieutenants at the precincts, however, are kept busy examining the cards, and the five blot-

ters which they have to look after. These books are the daily record, known as the "squeal book," in which is entered all complaints of robberies, thefts and burglaries; the arrest book, in which the names and pedigrees are entered; the aided book, for the record of persons injured; the telephone blotter, which contains all alarms and telephone communications, and the desk blotter, which records routine police business.

MOTOR VEHICLES

New Truck for Street Work.

Bristol, Va.—The city has received its new truck for the street department. It cost a little over \$4,000 and has one of the latest types of automatic dumping bodies, suitable for hauling stone, dirt and other street material. A committee composed of the city council recently went to Detroit and made the purchase of the new machine. The new truck has a capacity of three tons and is of G. M. C. make.

New Truck in Service.

Ensley, Ala.—Ensley's new motor-driven Seagrave fire truck is now in active service. The new machine is a triple combination truck with a self-starter, electric lights, a 40-gallon chemical tank, 200 feet of chemical hose, a pump with a capacity of pumping 750 gallons per minute, 1,500 feet of hose, two small chemicals, one 28-foot ladder and a small 12-foot ladder and a complete fire fighting net. The truck has solid rubber tires and weighs five and a quarter tons when empty. The Ensley fire department on a number of occasions has been seriously handicapped owing to the low water pressure, but this will be remedied by the new machine.

U. S. Fire Apparatus in South American City.

Guayaquil, Ecuador.—Guayaquil's efficient fire-fighting force is well known throughout South America. It is equipped with modern American apparatus, against which no fire of recent years has been able to make serious headway. Recently another engine was landed here, of the automobile Brockway type, with 800 feet of hose, having a four-cylinder motor of 35 horsepower. It is provided with a chemical tank of 25 gallons capacity and 200 feet of hose, ejecting a stream of liquid 30 feet, together with two 3-gallon hand machines. There is also a full equipment of other apparatus required for the work, including a strong acetylene headlight and fire bell. The machine carries 10 men, and has already been placed in the service. It was made at Elmira, N. Y.

Municipal Garage Ends Joy Rides.

New York, N. Y.—Furnishing automobiles to twenty-two different city departments on the same basis as that of a taxicab company is the work of the new municipal garage, under the elevated approach to the Brooklyn Bridge. This new service was begun last January. With a capital of \$137,500.50 it has purchased fifty-four cars, hired chauffeurs, machinists and washers, whose pay for the year will amount to \$65,387.50, and is ready to give 97,999 hours of automobile service to the department. The manager is Charles I. Crocker, engineer in charge of the Brooklyn Bridge. Each one of the thirty-six chauffeurs is supplied with a card, and upon this must be entered the time he was ordered to report for his fare and the actual time he did arrive. After that comes the length of time which the car was kept waiting, the number of passengers, where the machine went, the stops made and for how long, and if a woman is in the car special mention must be made of the fact, although her name is not taken. Each time a car is sent out to a department a bill is rendered for the amount of service. If it is one of the large touring cars, in charge of a chauffeur, the rate per hour is \$1.60. If it is a smaller car, with a chauffeur, it is \$1 an hour, and if it is a small car, without a chauffeur, the charge is 40 cents an hour. These bills are charged up against the appropriation which the department has been granted for automobile service, and when that money is used up it means more money or no cars. In running this garage bridge commissioner Kracke was able to use space already owned by the city for housing.

An old, little-used storage building was fitted up at a total cost of less than \$3,000, and there the city has space in which to care for fully ninety cars. Now a large majority of the city-owned cars not used by the police or fire departments are managed from here, and because of its proximity to lower Manhattan it is very convenient. Some twenty of the small cars which are not manned with chauffeurs are kept in sub-garages about the city, but these come to headquarters for repairs and overhauling.

City Manager for Motor Apparatus.

Sandusky, O.—The motorizing of the fire department is urged by City Manager K. B. Ward for the following reasons: "Motor-drawn equipment can reach the scene of a fire much quicker than horse-drawn apparatus. Horses, drawing heavy equipment, can endure a hard run for only one mile. Overhead expense on motor apparatus is less than that on horse-drawn. Motor apparatus requires fewer men, and upon reaching the scene these men can be assigned places in the fire fighting brigade. When horse-drawn apparatus reaches a fire," said the manager, "at least one man and probably two are left to watch the horses. Again, cost figures show that each horse in the department consumes food valued at 75 cents per day. In a year, the four horses at the No. 3 station eat nearly \$1,000 worth of forage. Two drivers are maintained at the station. They take the teams to a fire and there guard them. The services of one of these men could be dispensed with, with motor equipment. This would mean a saving of \$840 per year. The overhead on machines would not run over \$300."

GOVERNMENT AND FINANCE

Cost of Government in Kansas.

Topeka, Kans.—The general revenue fund, which was used to meet general operating expenses of the state during the fiscal year ending June 30, amounted to \$4,466,114.67, according to a statement made by W. E. Davis, state auditor. Receipts of a year ago were approximately \$43,000 less than for the year just ended. The amount does not include funds by special appropriation, it was stated. Direct taxation brought \$3,508,011.98 into the state treasury during the year. The report also shows the state insurance department paid in \$402,547.27; \$184,097 came from the secretary of state; \$50,538.52 from the bank commissioner's office; inheritance tax, \$64,117.54; excise tax, from Pullman car and express companies, \$56,705.34; sand royalties netted \$2,516.03, and \$1,132.55 came from the oil inspection department. Other smaller funds made up the total amount.

Capital of Merchants May Be Taxed.

Richmond, Va.—Capital of merchants can be assessed for taxation by cities at whatever rate the city may see fit to fix, is the substance of a ruling issued by the supreme court of Virginia. The decision was given in the appealed case of the city of Richmond against Drewry, Hughes & Company, appealed from the hustings court of Richmond. The supreme court granted a writ of error and supersedeas. The case attracted wide attention here as it meant a great reduction in the revenues of the city, the hustings court having given a verdict in favor of the merchant concern, allowing a tax of 30 cents on the \$100, in lieu of the city rate of \$1.40 on the \$100. City attorney Pollard in his brief to the supreme court argued that the tax law fixed by the special session of the legislature in 1916 specifically excepted "capital of merchants" from the list of intangibles segregated to the state. The city attorney further argued that the city of Richmond, under its charter, had the right to tax capital of merchants at any rate it deemed advisable to fix.

Lost Saloon Licenses Cause Road Tax.

Hot Springs, Ark.—The lights of Hot Springs' white way will be turned off and the city will resume its former lighting system in vogue before the way was installed. A road tax of \$10 per annum on each male citizen between the ages of 18 and 45 years will be levied to meet the running expenses of the city. The city council, in an effort to keep the city on a cash basis, has been forced to pass

these drastic measures. When the saloons went out of business on January 1, Hot Springs lost \$41,000 in licenses that had been available in former years. The levying of an occupation tax was resorted to in the hope that it would tide the city over, but this tax was nullified by the supreme court, and many of those who paid this tax are asking that this money be refunded to them. The Citizens' Electric Company has a contract with the city to furnish the current for the white way and it is likely that the conditions of this contract could be enforced if the company felt inclined to do so. The \$10 road tax, if collected, could not legally be used for any other purpose than for street and road work, and there has always been a doubt as to the legality of a tax of this character against boys between 18 and 21. On the other hand, it is argued that males between 18 and 21 would be required to work out the tax and not pay it in cash, which is the real intent of the law. The \$10 road tax ordinance which will be revived was originally passed in 1907, under the administration of mayor Jodd. It was allowed to lapse in its enforcement soon afterwards and since that date there has been no effort made to collect this tax. Opposition against the tax is already being organized.

Tax Difficulties of Maryland.

Annapolis, Md.—Holding that it is the duty of the legislature to prescribe uniform rules for the assessment of property in separate communities of the state and that it cannot delegate that power to a separate and subordinate authority, an opinion was handed down in the circuit court for Frederick county which strikes down the Act of 1916, under which the State Tax Commission had directed the several boards of county commissioners to appoint assessors for a general re-assessment of real estate. The decision is a victory for the merchants of the city of Frederick by whom the action was brought. The commissioners of that county had in the meantime refused to appoint the assessors. Anne Arundel, Harford, and several other counties of the state share in the victory, as the commissioners of each of these counties likewise declined to abide by the mandate of the State Tax Commission. The matter will be taken to the court of appeals for a final decision at a special sitting. If the court of appeals concurs, the only recourse is a special session of the general assembly. The contention of the complainants that the acts providing for the re-assessment were invalid, in view of the fact that the proposed re-assessment would not apply equally throughout the state was overruled by the court. The contention that Baltimore city was not included in the re-assessment plan was referred to by the court, which explained that there are separate enactments by which property in Baltimore city is subjected to a continuing process of revision in order that it may be assessed for state and municipal taxes according to its real value. "The question of most serious concern in the case," says the court, "arises from the fact that the legislature, by the act of 1916, has sought to delegate to the State Tax Commission the whole duty of formulating a uniform plan of assessment. This is a duty which the people imposed upon the legislature. The confusion seems to have originated because prior to 1915 the Constitution contained this clause: 'All persons in Maryland holding property therein ought to contribute his proportion of public taxes according to his actual worth.' The legislature of 1914 approved an amendment which was ratified by the people in the election of 1915. This amendment changed the law so that it read: 'The General Assembly shall by uniform rules provide for the separate assessment of land and classification and sub-classification on improvements and personal property as it may deem proper.' The legislature of 1916, the last, adopted no rules. A bill was introduced providing for classification. It passed the senate, but was killed in the house. Officials of the State Tax Commission say the bill had the support of the commission, but it was not then nor is it now regarded as essential to a new assessment of property. The court said: 'It is the plain purpose of the amendment that land and the improvements thereon shall be separately assessed, and that improvements and personal property shall be classified according to uniform rules which

the legislature shall prescribe.' The mandate of the people to that effect, as conveyed by the Constitutional amendment which they adopted, is clear and unqualified. It creates a duty which it makes expressly legislative in its character and which is, therefore, not capable of being delegated. It affirmatively charges the General Assembly itself to establish the uniform rules by which assessments for taxation purposes shall be conducted."

STREET CLEANING AND REFUSE DISPOSAL

City to Collect Garbage.

Binghamton, N. Y.—Complaints relative to the inability of householders to have their garbage collected and properly disposed of continue to be made to city officials and the administration has decided that next year Binghamton will possess a garbage collection system of its own. When the Board of Estimate convenes in October it will place in the budget a sum sufficient to meet the expense of collecting garbage. Whether action will be taken to provide a garbage incinerator next year or whether the city will continue to bury its garbage for a time will be decided later. The collection will be made under the auspices of the department of public works. The initial cost will be the greatest, as this will include the purchase of wagons for collecting the garbage and other utensils. It is probable that motor vehicles instead of horses will be used for this purpose and each property owner will be required to furnish his own garbage and ash cans. Ashes will be removed as well as garbage and the result will greatly lighten the work of the assistant sanitary inspector, who now spends much of his time inspecting unsanitary ash piles and compelling property owners to clean up.

City Starts Garbage Collection.

Sandusky, O.—The city has begun its new system of garbage collection, one wagon being placed in service, collecting from the 200 subscribed citizens, the first on the list. Most of these were near the center of town. Dr. J. W. Reeder, city food inspector, Warner Kuebler, sealer of weights and measures, and Tom Schwenck, of the city engineering department, are soliciting for the new department. It is expected that enough names will be secured to put three wagons into use. Manager Ward has worked out a plan of keeping a record of the garbage collected. Residents served are to make quarterly payments to the office of the city treasurer. The schedule calls for weekly collections, and in addition daily trips will be made to places where such service is necessary. Persons, other than those employed by the city, engaged in the hauling of garbage without special permits from the city manager, are to be prosecuted, according to the ordinance recently passed providing for the system. The owner, tenant or occupant of a building must provide a suitable water tight metal can of not more than twelve gallons capacity with tight fitting cover and with handles, for the reception of their garbage. No paper, rags, ashes, etc., are to be put into the cans.

Garbage Collector Fined.

Utica, N. Y.—Charging John R. Baxter, Jr., & Co., with breaking the schedule which he had prepared for the collection of garbage and with failing to live up to their contract in making the required number of collections each week, Commissioner of Public Works Harry R. Hayes has imposed a fine of \$63 on the company with a warning that a fine of \$3 will be assessed for each complaint of a failure to collect garbage. In his warning Commissioner Hayes says: "Failing in my efforts to have a complete route list made out by you, I submitted to you a schedule of the routes and you had a week in which to route your wagons before the new schedule was to become effective. On the day when you were supposed to begin operation of the new schedule it was found that you had made very little, if any preparations for adopting it. I put on extra inspectors, with the idea of facilitating the operation of the schedule, and to assist the men in routing the different wagons. This

schedule has now been in effect nearly three weeks, and your organization does not appear to be very anxious to conform thereto. Wagons have been changed from one district to another by your orders, and employees of yours have in many ways endeavored to interrupt and confuse the operation of the schedule. The districts have not been properly collected as scheduled, and from my observation of the work during the last three weeks, it appears to me that you have not an organization of sufficient size to provide bi-weekly collections as provided in your contract. Under the schedule used by you prior to July 24 some sections of the city were receiving collections once a week, some sections two collections, and other sections were fortunate in receiving a collection once in two weeks."

Former Mayor Fights Garbage Contract.

Atlantic City, N. J.—Charging that the board of commissioners is preparing to pay out \$12,000 illegally for the disposal of the city garbage, former Mayor William Riddle has brought a suit in the court of chancery to restrain the action. Former Mayor Riddle alleges that no bids were asked for in the matter and that no contract was ever awarded as the law requires. He claims also that the money will be practically a gift to the Atlantic Products Company, which has the contract for the garbage disposal. Among the stockholders of this company are a number of Atlantic City politicians. The Atlantic Products Company has a five-year contract for the garbage disposal which expires August 31. Its reduction plant was in the city and about a year ago it was declared a nuisance because of the odors which emanated from it. A new company was formed called the Farmers' Supply & Products Company, to dispose of the garbage on Crab Island, eighteen miles from the city. This new company was the lowest bidder for the work and was awarded the contract. The plan to dispose of the garbage on Crab Island has been proceeded with and the \$12,000 involved in the present suit is the additional sum that was to be paid to the company for the work besides its regular contract price. The ordinance providing for this payment was passed July 13, last.

MISCELLANEOUS

Recall Blames Mayor for Typhoid.

Munising, Mich.—Petitions have been filed for the recall of Mayor C. A. Trueman. Mayor Trueman and his administration are charged in the petitions with being responsible for the recent outbreak of typhoid, which it is set forth, is due to impure water. Appointments on the police force are also attacked. Mayor Trueman succeeded Thomas G. Sullivan, who was recalled by a vote of the people last October. Munising is operating under the commission form of government, and one of the reasons for changing from the old system was to do away with the annual political contest. Under the commission charter the mayor is elected for a term of three years and it was thought the elections would not come oftener than once in three years, the recall provision notwithstanding. The new charter had not been adopted more than a year when the mayor was recalled. The present mayor has been in office a year.

Record of South African Railways for Year.

Johannesburg, South Africa.—Statistics relating to the management and operation of the South African (government) Railways for 1915 are given in the annual report of the general manager, just issued. The open mileage on December 31, 1915, was 8,924, an increase during the year of 438 miles. The total capital expenditure on railways and harbors to December 31, 1915, was \$490,646,579. The average cost of the open lines is \$47,706 per route mile, including workshops and rolling stock equipment. The gross earnings in 1915 were \$59,361,032 and expenditures \$38,263,547. In 1914 the earnings were \$56,029,007, and expenditures \$43,020,872. The ratio of passenger earnings to total earnings increased from 24.9 per cent in 1911 to 28.34 per cent in 1915, while the ratio of goods earnings

diminished in almost the same proportion, attributable to large reductions in rates in 1912.

The ratio of expenditure to earnings has decreased by 11.95 per cent compared with 1914, and 7.9 per cent compared with 1913. While revenue is lower than in 1910, expenditure has increased by almost \$4,866,500, mainly because the 1912 rate reduction involved a sacrifice in revenue approximating \$7,299,750 per annum. The net profit from railways carried to revenue distribution account was \$6,376,964.

Erie Retains Expert.

Erie, Pa.—With its provisions changed so that Farley Gannett becomes actively associated with the engineering force of the city, an ordinance providing for a contract between the city and Mr. Gannett for the preparation of plans and the engineering supervision of the Mill Creek improvements has been drawn up by Street Director Kinney. The original contract is withdrawn. The old contract, submitted by Mr. Gannett's attorneys and having the approval of City Solicitor Duff, carried a clause to the effect that Mr. Gannett would carry out the work under a separate organization, and in no way be connected with the city engineering forces. Another important change in the new contract is a specific agreement that Mr. Gannett will receive his commission of three and one-quarter per cent solely on the contract figure for the construction work. He will receive no commissions on city administration expenses and awards for property damages that may result.

\$1,020,000 Bonds Illegal.

Los Angeles, Cal.—Superior Judge Wellborn has handed down a decision in the quo warranto proceedings brought by Attorney General Webb for the State, declaring that because of the technical blunders the \$1,020,000 bonds voted for the acquisition of the Union Hollywood Water Company's distributing plant is invalid. The flaw in the proceedings consisted in the fact that the ordinance calling the election did not include three precincts included in the ordinance of intention. As a result of this omission the residents of the three precincts had no opportunity of voting on the proposition. Judge Wellborn held that this error was vital, even though there were not enough votes in the three precincts to have affected the result of the election. There are about 1,200 votes in the precincts and the vote on the bond issue was 3,192 to 409 against. The bonds had already been sold to a Chicago banking house and part of them had been printed. In addition to the proceedings brought by the attorney general a citizen of one of the precincts had filed suit to restrain the sale of the bonds, on the ground that they would constitute a lien on his property, when he had been given no voice in the matter. The city, as defendant in the action, was represented by Attorneys W. B. Mathews and Whitehead. They admitted the correctness of the allegations in the complaint.

Race Segregation in Effect.

Dallas, Tex.—The Dallas race segregation ordinance is now in effect. Whether it will continue depends upon the outcome of the charter amendment suit now pending in district court and set for a hearing September 1. Where negroes already occupy part of a block, the city can do nothing, under the terms of the ordinance. There is considerable misunderstanding as to what constitutes a block under the terms of the ordinance. It is construed to mean both sides of any street between intersecting streets, and not the entire area bounded by four streets. Thus, negroes whose houses face on one street may live in the rear of whites whose houses face on another street, but they cannot live facing them on the same street unless the block is an open one. Hereafter no negro can move into a block occupied solely by white people and no white person can move into a block where only negroes reside. Present conditions are unchanged. If a block is occupied solely by whites, with the exception of one negro resident, or vice versa, it is an "open" block and either race may live there. The ordinance in no way affects the occupancy of servants' houses owned by either race. A penalty of \$200, maximum, is provided for violation of the ordinance.

LEGAL NOTES

A Summary and Notes of Recent Decisions— Rulings of Interest to Municipalities

Power of City to Order Water Company.

Wichita Water Co. v. City of Wichita.—A city of the first class has power to make reasonable orders directing a water company to relocate its water mains and hydrants to conform to the establishment of another and later public utility; and the exercise of such power is governmental, and the city is not liable for the expenses incurred by the water company in making such changes in obedience to the city's commands.—Supreme Court of Kansas, 158 P. R., 49.

Ordinance Regulating Traffic—Validity.

Freeman v. Green.—A general ordinance of the city of St. Louis, applying to all vehicles of every nature, and giving those going in an easterly or westerly direction the right of way over those proceeding in a northerly or southerly direction, is not void as in conflict with Motor Vehicles Law (Laws 1911, p. 322).—St. Louis Court of Appeals, Missouri, 186 S. W. R., 1166.

Fire Escapes—Ordinances—Construction—Implied Repeal.

Mullins v. Nordlow.—Where a municipal ordinance, requiring buildings to be furnished with fire escapes provided that on new buildings brackets to support the fire escape, should be set as the walls are being constructed, and that on old buildings, holes should be drilled through the walls for that purpose, it is apparent that the ordinance applies, not only to new, but to old buildings. Where a subsequent ordinance relating to equipping buildings with fire escapes and covering the entire subject conflicted with the provisions of an earlier one, which was retained in the published ordinances, the first ordinance is repealed by implication.—Court of Appeals of Kentucky, 185 S. W. R., 825.

Police Regulations—Validity.

City of Goodland v. Popejoy.—A section of an ordinance of a city of the second class made it unlawful for an owner or occupant to deposit tin cans, manure, ashes, garbage, and other refuse matter on his lots or to allow such matter to remain on his lots. The condition that the refuse matter should be offensive to others or detrimental to the public health or welfare was not recognized, no distinction was made between noxious and innocuous deposits or accumulations, and the offense was complete if any of the things mentioned were deposited or allowed to remain, whatever the quantity, circumstances, or length of time. Held, the section of the ordinance was beyond the authority conferred on cities of the second class to secure the general health and to prevent and remove nuisances.—Supreme Court of Kansas, 157 P. R., 410.

Ordinance Requiring Oil Separator—Validity.

Stubbe et al v. Adamson et al.—Under Code of Ordinances of the City of New York, c. 10, providing that no garage permit authorizing the storage of volatile inflammable oil shall be issued for any premises, storing more than 4 motor vehicles, which are not provided with an oil separator, trap, or other similar apparatus attached to the house drain to prevent the oils from flowing into the sewer, the expenditure of \$200 required for the installation of an oil separator in the petitioners' garage is not so great, considering the dangers sought to be averted and the business to be conducted on the premises, as to justify the court in declaring the ordinance oppressive, although there may be a question with respect to the efficiency of the device required to be installed, since the validity of a statute or ordinance, or its applicability, is not to be decided upon what has been or is being done, but what may be done, and not by its effect in a particular case, but upon a consideration of its general purpose.—Supreme Court, Appellate Division, First Department, 159 N. Y. S., 751.

NEWS OF THE SOCIETIES

Calendar of Meetings.

Sept. 4-8.—SOUTHERN APPALACHIAN GOOD ROADS ASSOCIATION. Ninth annual convention, Lexington, Ky. Secretary, Dr. Joseph Hyde Pratt, Chapel Hill, N. C.

Sept. 8-9.—LEAGUE OF AMERICAN MUNICIPALITIES. Annual convention, Newark, N. J.

Sept. 11-16.—KANSAS STATE FIREMEN'S ASSOCIATION. Annual convention, Topeka, Kans.

Sept. 12-15.—ATLANTIC DEEPER WATERWAYS ASSOCIATION. Annual meeting, Philadelphia, Pa.

Sept. 13.—CENTRAL FLORIDA HIGHWAY ASSOCIATION. Annual meeting, Fort Myers, Fla.

Sept. 13-15.—NEW ENGLAND WATER WORKS ASSOCIATION. Convention, Portland, Me. Secretary, Willard Kent, Narragansett Pier, R. I.

Sept. 13-15.—WASHINGTON STATE ASSOCIATION OF COUNTY COMMISSIONERS. Annual meeting, Tacoma, Wash. Secretary, J. C. Hansen, Fort Angeles, Wash.

Sept. 14-15.—WISCONSIN CHIEFS OF POLICE ASSOCIATION. Annual meeting, Milwaukee, Wis. J. T. Jassen, Chief, Milwaukee Fire Department.

Sept. 18-20.—ILLUMINATING ENGINEERING SOCIETY. Annual Convention, Philadelphia, Pa. Asst. Secretary, C. D. Fawcett, 29 West 39th street, New York City.

Sept. 19-21.—LEAGUE OF IOWA MUNICIPALITIES. Nineteenth annual meeting, Dubuque, Ia.

Sept. 20-22.—MASSACHUSETTS STATE FIREMEN'S ASSOCIATION. Annual convention, Gloucester, Mass. Secretary, D. Arthur Burt.

Sept. 26.—NATIONAL SMOKE PREVENTION ASSOCIATION. Eleventh annual meeting, St. Louis, Mo. Secretary, Frank A. Chambers, Smoke Department, Chicago, Ill.

Sept. 26-28.—LEAGUE OF VIRGINIA MUNICIPALITIES. Annual meeting, Clifton Forge, Va. Secretary, Luther C. Brinson, Portsmouth, Va.

Oct. 2-6.—PLAYGROUND AND RECREATION ASSOCIATION OF AMERICA. Congress, Grand Rapids, Mich. Secretary, H. S. Braucher, 1 Madison avenue, New York City.

Oct. 9-11.—NATIONAL HOUSING ASSOCIATION. Annual meeting, Providence, R. I. Secretary, Lawrence Veller, 105 East 22d St., New York City.

Oct. 9-13.—AMERICAN ELECTRIC RAILWAY ASSOCIATION. Annual convention, Atlantic City, N. J. Secretary, E. B. Burrill, 8 West 40th street, New York City.

Oct. 9-13.—AMERICAN SOCIETY OF MUNICIPAL IMPROVEMENTS. Twenty-third Annual Convention, Robert Treat Hotel, Newark, N. J. Secretary, Charles Carroll Brown, 702 Wulsin Building, Indianapolis, Ind.

Oct. 10-15.—LEAGUE OF CALIFORNIA MUNICIPALITIES. Annual meeting, Visalia, Cal. Secretary, H. A. Mason, Pacific Bldg., San Francisco, Cal.

Oct. 11-13.—LEAGUE OF KANSAS MUNICIPALITIES. Annual meeting, Independence, Kan. Secretary, C. H. Talbot, University of Kansas, Lawrence, Kan.

Oct. 13, 14.—SOCIETY FOR STREET CLEANING AND REFUSE DISPOSAL. Annual convention, Street Cleaning Department Building, New York City. Secretary, J. R. Buchanan, Municipal Bldg., New York City.

Oct. 16-21.—NATIONAL SAFETY COUNCIL. Fifth Annual Safety Congress, Detroit, Mich. Secretary, W. H. Cameron, Continental and Commercial Bank, Chicago, Ill.

Oct. 17-20.—AMERICAN GAS INSTITUTE. Annual meeting, Chicago, Ill. Secretary, G. G. Ramsdell, New York City.

Oct. 24-27.—AMERICAN PUBLIC HEALTH ASSOCIATION. Annual Convention, Cincinnati, O. Secretary, Prof. Sellkar M. Gunn, Boston, Mass.

Nov. 15-16.—NATIONAL CONFERENCE ON UNIVERSITIES AND PUBLIC SERVICE. Third annual conference, Philadelphia, Pa. Secretary, Edward A. Fitzpatrick, Box 380, Madison, Wis.

Nov. 16-18.—FIRE MARSHALS' ASSOCIATION OF NORTH AMERICA. Annual convention, Nashville, Tenn.

Nov. 21-23.—CITY MANAGERS' ASSOCIATION. Annual meeting, Springfield, Mass.

Nov. 22-24.—CONFERENCE ON MUNICIPAL RESEARCH, Springfield, Mass.

Nov. 23-24.—CIVIC SECRETARIES CONFERENCE. Annual meeting, Springfield, Mass.

Nov. 23-25.—NATIONAL MUNICIPAL LEAGUE. Annual convention, Springfield, Mass. Secretary, Clinton Rogers Woodruff, 705 North American Building, Philadelphia, Pa.

Dec. 27-30.—AMERICAN ECONOMIC ASSOCIATION. Annual meeting, Columbus, Ohio. Secretary, A. A. Young, Ithaca, N. Y.

Dec. 27-30.—AMERICAN STATISTICAL ASSOCIATION. Annual meeting, Columbus, O. Secretary, Carroll W. Doten, 491 Boylston street, Boston, Mass.

Dec. 29-31.—AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE. Annual meeting, New York City. Secretary, L. O. Howard, Smithsonian Institute, Washington, D. C.

Jan. 20, 1917.—WESTERN PAVING BRICK MANUFACTURERS' ASSOCIATION, Kansas City, Mo. Secretary, G. W. Thurston, 416 Dwight Bldg., Kansas City, Mo.

Jan. 23-25, 1917.—AMERICAN WOOD PRESERVERS' ASSOCIATION. Annual meeting, New York City. Secretary, F. J. Angier, B. & O. Mt. Royal Sta., Baltimore, Md.

Feb. 5-12, 1917.—AMERICAN ROAD BUILDERS' ASSOCIATION. Seventh American Good Roads Congress and Eighth National Good Roads Show, Mechanics Hall, Boston, Mass. Secretary, E. L. Powers, 150 Nassau street, New York City.

International Association of Municipal Electricians.

The annual convention of the International Association of Municipal Electricians was held in Baltimore, Md., August 22-25. The meeting brought together some of the leading electrical men from the whole country, and many excellently prepared papers were heard and discussed.

President W. H. Flandreau of Mt. Vernon, N. Y., opened the meeting at half past ten Tuesday morning. In the absence of Mayor Preston, his secretary, Robert E. Lee, gave the welcoming address. Dr. Charles P. Steinmetz responded to the welcoming speech; following this was the president's address, after which the convention was adjourned until the afternoon session.

Several interesting papers were read at the first business session, Tuesday afternoon. These were as follows: By C. F. Abbott, Pittsburgh, on "Concentric Wiring"; by W. J. Canada of the Bureau of Standards of Washington, on "Wireless Interference with Interior Wiring and with Signal Lines"; by R. A. Smith, city electrician of Norfolk, Va., on the "National Code and Its Value to Our Association," and by Dr. Whipple, on "Rubber Insulation for Electrical Purposes."

At 8 o'clock Tuesday evening the first meeting of the season of the National Electric Light Association was held at the Odd Fellows' Hall in connection with the entertainment tendered the visiting delegates by the Consolidated Gas and Electric Company. Dr. Steinmetz addressed this meeting.

At 10 o'clock on Wednesday morning Dr. Steinmetz again addressed the convention, this time on "Electric Power and Its Value to a Municipality." Following Dr. Steinmetz, Frank J. Dix, general superintendent and chief electrician of the Fort Wayne municipal electric light and power works, spoke on "A Publicly Owned Electric Light Utility."

At 2 o'clock Wednesday afternoon the delegates were taken on a pleasure trip down the bay.

Thursday morning F. H. Moore, president of the Western Association of Electrical Inspectors, read an interesting paper on "Electric Fire Hazard." In part, he said:

"The establishment of the national electric code has done more than any other piece of legislation to prevent disastrous fires. While manufacturers may believe that a great hardship is being worked upon them by this code, it is only through the enforcing of such stringent rules that the lives and property of a community are safeguarded."

"The Bureau of Standards at Washington is now framing a national electrical safety code that goes a step farther than the present one, eliminating all the defects of the former, and embodying such rules as point to the ultimate elimination of fires caused by short circuits, groundings, and so on."

A paper was also read by L. S. Bach, Newark, N. J., on "Street Signals and Traffic Warnings in Connection with Fire Apparatus," in which he praised the new system installed recently in Baltimore, consisting of a siren that sounds a warning upon the approach of a fire apparatus.

At the Thursday afternoon session several interesting papers were delivered, including "Why the Fire Box?" by Louis Gascoigne, superintendent of the fire telegraph, Detroit, Mich., and "The Telegraph in the Police Department," by John W. Kelly, Jr., chief of the Bureau of Electricity, Camden, N. J.

Friday morning at 10 o'clock, Dr. John Price Jackson, the Commissioner of Industry of Pennsylvania, spoke on "The Advances in Electrical Signaling." The reports of the committee on high voltage, and the committee on exhibits, were read later. Friday's afternoon session was devoted to the reading of the reports of the committees on publicity, licensing electricians, and electrolysis.

R. A. Haskill, Fort Wayne, Ind., was elected president at the Thursday session and Niagara Falls, N. Y., was selected as the place for the 1917 convention.

The convention came to an end Saturday, after a visit by the delegates to Washington for an inspection of the Bureau of Standards.

American Waterworks Association.

Iowa and Illinois Joint Session.

A joint session of the Iowa and Illinois sections of the American Waterworks Association will be held at Davenport, Iowa, and Moline and

Rock Island, Illinois, October 10 and 11. The meeting of the Iowa section will be held at Davenport, starting at ten o'clock in the morning of October 10 with an address of welcome, followed by a round table discussion. In the afternoon, papers will be read, and a business session will follow the readings. In the evening more papers will be delivered.

Both sections will meet at Rock Island, Ill., October 11. The members will assemble at the filter plant, which will be inspected, as will the government arsenal, if permission can be secured. After inspection, the party will go by trolley car to Bettendorf, Ia., where they will inspect the water plant, and will have luncheon, as guests of the Davenport Water Company. An automobile trip to the reservoir pumping station of the Davenport Water Company is arranged for the afternoon, followed by a visit to the Rock Island

pumping station and filter plant. A visit to the Moline filtration plant and pumping station will end the afternoon session. Two illustrated papers will be presented at the evening session.

Texas Good Roads Congress.

Evidence of rapid progress of the good roads movement in Texas was offered at the joint convention of six organizations engaged in promoting the highway interests of the state, held at San Antonio, Aug. 17-19. Representatives of the Texas Good Roads Congress, the Texas Good Roads Association, the Southern National Highway Association, the Meridian Road Association, and the Puget Sound and Gulf Highway Association attended the initial session of the convention.

Hardly had the convention got under way before a plan to seek legislation creating a State highway commission became the subject of general interest.

Secretary D. E. Colp of San Antonio reported that thirty members of the House of Representatives had pledged themselves to vote for the creation of a highway commission, and that many of the State Senators were favorable to such proposed legislation. Although Texas has outdistanced every other State in the Union in pushing the good roads movement, he said, it is one of the two States in the Union that have no highway commission.

The first day's program was devoted largely to an exposition of the fact that good roads are essential to material progress. Though the general progress of the good roads movement consti-

(Continued on page 273.)

PROBLEMS CITIES ARE STUDYING WITH EXPERTS

De Land, Fla., is receiving bids on extensive STREET improvements, and PAVING. Plans for the work were prepared by the J. B. McCrary Co., Third National Bank Bldg., Atlanta, Ga.

Jefferson Davis Parish, Jennings, La., will expend about \$500,000 for ROAD construction. W. L. Stevens, Whitney-Central Building, New Orleans, has been retained as engineer, and is making surveys now.

Leake County, Miss., is constructing several miles of sand-clay ROAD under the direction of M. D. Smith, consulting engineer, Kosciusko, Miss.

The city of Nashville, Ark., contemplates the construction of a SEWER system. Plans are being drawn by Dove & Winter, engineers, Fort Smith, Ark.

A sanitary SEWER SYSTEM and WATER WORKS are being constructed by the city of Hogansville, Ga., from plans and specifications prepared by C. F. Kauffman & Bros, consulting engineers, Candler Bldg., Atlanta, Ga.

Plans for a WATERWORKS system at Newport, Ark., are being prepared by White, Humphreys & Tovey, consulting engineers, Pine Bluff, Ark.

The village of Takoma Park, Maryland, is about to construct a large storage RESERVOIR. Harry Stevens, Union Trust Bldg., Washington, D. C., is engineer in charge.

A WATERWORKS and SEWER system is contemplated by the village of Kingsport, Tex. Plans are being drawn by Knight and Quayle, engineers, Chattanooga.

The Marianna road district commissioners, Holly Springs, Miss., contemplates fifteen miles of ROADS. Walter G. Kirkpatrick, 704 Farley Building, Birmingham, Ala., is employed as engineer on the project.

The city of Chicago, Ill., will construct a large reinforced concrete RESERVOIR, and has retained Dabney H. Maury, of Chicago, as consulting engineer.

The village of Ellis, Kansas, is having plans prepared for improving its WATER system by Black and Veatch, Kansas City, Mo.

Sanitary SEWERS will be constructed in the near future by the village of Witt, Ill., from plans prepared by the Warren Engineering Co., Powers Bldg., Decatur.

A new SEWER system is being designed for Sparrows Point, Md., by Norton, Bird and Whitman, consulting engineers.

The village of Brooksville, Fla., is considering the construction of a WATERWORKS system, and has retained Hiram McElroy, of Tampa, as consulting engineer.

WATERWORKS improvements will be started soon by the city of Wewatunga, Okla. MacIntosh and Walton of Oklahoma City, are the engineers.

For the construction of its sanitary SEWER system, the town of Huntsville, Tex., has retained M. Griffin O'Neill & Sons, Praetorian Bldg., Dallas, Tex., as consulting engineers.

For gravel and concrete ROAD construction, Bonham, Tex., has secured the services of G. A. McClellan, consulting engineer, Ladonia, Tex.

Elmhurst, Ill., is constructing a SEWER system and DISPOSAL PLANT, from plans prepared by E. L. Hancock, consulting engineer, 2047 Ogden avenue, Chicago, Ill.

The village of Downs, Kans., is receiving bids for the construction of a sanitary SEWER and DISPOSAL PLANT. E. T. Archer & Co., New England Bldg., Kansas City, Mo., are the engineers.

PERSONALS

Burke, John, former assistant chief engineer of the Portsmouth, O., waterworks, has been appointed chief engineer, succeeding G. W. White, who resigned.

Callery, John, has been appointed superintendent of the Newport, Ky., waterworks, succeeding J. A. Maher, who died recently.

Collins, B. W., superintendent of electric work of Tacoma, Wash., has resigned, to take effect September 1. He will accept the position of general manager of the Northwestern Electric Light and Power Co., with construction headquarters at Montesano. Mr. Collins has been superintendent of the Tacoma electric light and power system for five years.

Herter, Emil, for almost thirty years Thomas A. Edison's chief mechanical engineer in the laboratory at the West Orange plant, and who has worked on many of Edison's most important inventions, died at the Orange Memorial Hospital, after an illness of three weeks with heart disease. Mr. Herter had not been in the best of health for the last six years, but continued at his work, missing a few days at a time until three weeks ago. Mr. Herter was fifty-nine years old, and prior to entering the employ of Mr. Edison was a pattern maker for the United States Government. He had lived in Orange for the last eighteen years, moving to that city from New York. He was a member of the American Society of Mechanical Engineers.

Hill, H. W., has been appointed operator of the Steubenville, O., water filtration plant.

Riverside, H. L., who has been with the Pennsylvania Railroad for several years, is now resident engineer on street paving with Gilbert C. White, consulting engineer of Durham, N. C.

Short, Henry, has resigned as chief of the Etna, Cal., fire department and T. Harrison Howell has been chosen to succeed him. Mr. Short had served as chief five years.

Wells, J. N., has resigned as superintendent of the Wichita, Kan., Water Company.

NEW APPLIANCES

Describing New Machinery, Apparatus, Materials and Methods and Recent Interesting Installations.

"BEACH" TAMPER ROLLER.

For Gravel, Stone or Dirt Roads.

In order to overcome the difficulties of a heavy five-ton roller and the inadequacy of a lighter roller, the "Beach" tamper roller has been designed. It is a light machine, but not smooth-faced. Where a five-ton roller requires six horses the "Beach" roller requires only two and only one man to run it.

The roller weighs only 2,500 pounds light, or 3,500 pounds when fitted with weights. It is built so that it packs the bottom first. It is easily turned around. The sections are so constructed that small stones will not wedge in between the teeth. Every section is independent of the other. Any stone that might catch between the lugs drops out between the sections, making clogging impossible. It will roll the gravel into a compact mass where it is and will not force it over the shoulders. It grinds up the sod in building dirt roads and packs the road after it is built.

The boxings are provided with hard oil cups and the shaft turns in these boxings—each section being able to turn independently on the shaft. The frame is made of heavy steel angles and the tongue is well braced.

The accompanying illustration shows the roller, which has been widely and successfully used, especially in Michigan county highways. The tamper roller is made by the Beach Manufacturing Company, Charlotte, Mich.

DIESEL ENGINES.

National Transit Horizontal Engine with Improvements.

The advantages of the Diesel type of oil engine—thermal efficiency, low grade fuel operation with lower costs, saving in maintenance due to longer life of machine—are claimed to be increased in the National Transit engine. The improved design of the DH4A type is based on operating experiences in Europe and the latest American practice. The crosshead, for instance, is eliminated so that the overall length is shortened and the weight of reciprocating parts reduced.

The engine is of the horizontal, single acting, four-cycle Diesel type, of center crank construction, with a single flywheel and an outboard bearing. Operating on the low cycle principle, a charge of air is drawn into the cylinder on the suction stroke of the piston. The pressure of this air is increased on the return of the piston to about 500 pounds per square inch. The heat generated by this compression instantly ignites the charge of atomized fuel oil injected and expansion attending com-

plete combustion in the highly compressed air imparts the power to the piston. No hot bulb, electric spark or other external means of ignition is needed. To this is due the perfection of regulation and the smooth running free from shocks.

The main frame is a symmetrical one piece casting of adequate strength and rigidity. The cylinder liner is separate and removable, of cast iron and fitted into three bored supports in the main frame. The liner is held in place by the cylinder head and is free to expand and contract with temperature changes. The cylinder barrel is of ample diameter to insure a deep water

The valve seats are not cast in the head. The inlet valve seat is formed in the inlet edge and is located above the exhaust. Both valves are vertical. The valve heads are of cast iron, fastened to open hearth steel stems. Both valves are operated by rockers and wipers receiving motion from a single eccentric, thus making for easy running. The sprayer is of the open end nozzle type and is located in the extreme outer end of the combustion chamber. Fuel oil from the main fuel



BEACH TAMPER ROLLER.

jacket around the liner. Air passages are cast in the frame for conducting fuel air to and from the crank pit. The main bearings are of the quarter box type, lined with genuine babbit and lubricated by chain oilers. The outboard bearing consists of a main housing and cap which carry the upper and lower sleeves, similarly lined and oiled.

The power cylinder head carries the inlet valves, exhaust valve, air starting valve and the fuel sprayer. The thickness of the walls of the casting are proportioned to provide for uniform expansion and flexibility to withstand strains. The piston is of the trunk type, of sufficient length to insure a low unit bearing pressure on the liner, and is fitted with nine rings. The piston pin is of forged steel and of such size as to keep the unit bearing pressures low.

The crankshaft is of open hearth steel, hydraulic pressure forged. Counterweights of suitable proportions are bolted to the crankwebs and lubrication of the crankpin is obtained by means of brass grooved centrifugal rings. The connecting rod is made of a solid steel forging—piston end, solid type and crank pin end, marine type. All connecting rod boxes are of cast steel and babbited.

pump is deposited in the open channel of the sprayed body, as soon as the valve controlling the compressed injection air opens, this oil is injected into the combustion chamber thoroughly atomized and is ignited. The starting arrangement is very simple. A push rod located at the end of the cam shaft is moved into starting position. The compressed air cock is opened and the engine starts to run on air admitted to the cylinder, the sprayer valve being disengaged. Cylinder compression is reduced by a positively operated relief valve automatically opening the exhaust. When the speed is built up the push rod is shifted back, automatically disengaging the relief, bringing the sprayer into operation and permitting the air cock to be closed.

The main fuel pump and governor are mounted together on the side of the main frame, the pump being driven by an eccentric on the lay shaft, and the governor by spiral gears from the lay shaft—in turn driven from the crank shaft through cut spiral gears. The pump plunger is of the differential type, the upper part being hollow and having a cutoff valve seated at its upper end. The cutoff is under the direct control of a Jahns governor. Governing is ef-

fectured by allowing the cutoff valve to seat at a predetermined point in the upstroke of the plunger, thus delivering the correct quantity of oil to the sprayer. A two stage air compressor for spraying fuel, bolted to the side of the main frame, is driven by a spherically shaped eccentric through a long eccentric rod. Piston is of differential type; cylinders and valves amply water-jacketed. High stage air is discharged at about 1,000 pounds pressure to a seamless steel pipe which acts as a receiver.

An auxiliary fuel pump, driven from the lay shaft, is furnished for pumping fuel from storage tank to auxiliary fuel tank. An auxiliary air compressing unit is furnished to supply starting air for the main engine. This consists of gasoline engine, air compressor and suitable tanks.

The engine is guaranteed to develop one brake horse power per hour on .48 pounds of oil at full load, on .50 pounds at three-quarter load and on .58 pounds on half load. These figures are based on oil having 18,000 B.T.U. per pound, not heavier than 16 degrees Baume, with a flash point of 100 to 250 degrees F., free of acid and not having more than 1 per cent of water.

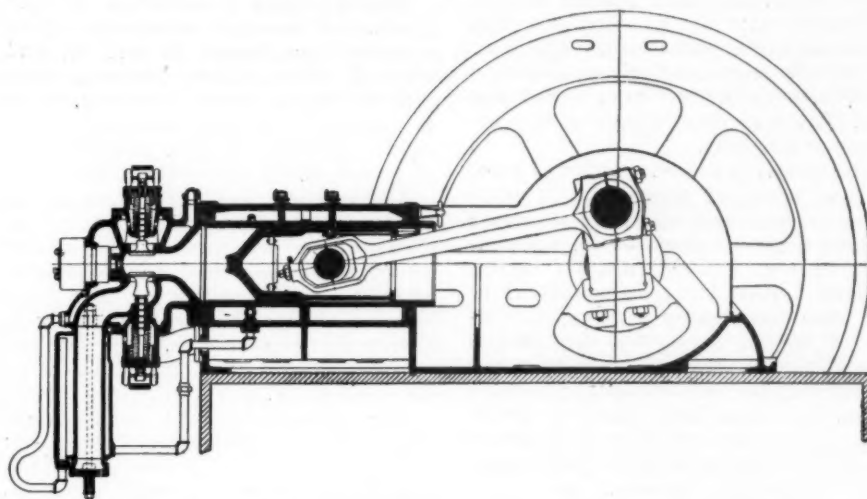
The engine is shown in the accompanying illustrations in section and in photographic view. It is made by the National Transit Pump & Machine Company, Oil City, Pa.

INDUSTRIAL NEWS

Cast Iron Pipe.—Chicago—Bids for 950 tons of pipe at Chicago were rejected as too high and new bids will probably be asked; all bids at Toledo and Ravenna were rejected or no awards made. Prospective lettings include 1,300 tons at Hamilton, Ind., and 1,800 tons at St. Louis. Quotations: 4-inch, \$33.50 to \$34; 6-inch and larger, \$30.50 to \$31. Class A, \$1 extra. Birmingham—Orders have not increased, but market is much stronger and there are indications of good contracts in

the near future. Large shipments were made to the Pacific coast incident to the raise in rates scheduled for September 1. Quotations: 4-inch, \$28; 6-inch and larger, \$25; 16-foot lengths, \$1 extra. New York—While the public lettings are rather few and small, the demand from private buyers continues

the delegates to the City Hall to inspect the record of street and road building in San Antonio. This city, he said, by reason of having experimented with so many different kinds of paving, has the most comprehensive record of paving that can be found anywhere in the world.



SECTIONAL DIAGRAM, NATIONAL TRANSIT DIESEL ENGINE.

to be strong. Quotations: Carload lots, 6-inch, class B and heavier, \$30.50, net at tidewater; class A, \$1 extra.

Lead.—There was a heavy demand for lead with large orders last week and the price advanced rapidly. Buying was for both domestic and foreign consumption, with demand for prompt delivery. Some sales have been as high as 6.55 cents and the New York quotation is 6.62½ cents, with St. Louis at 6.50 cents.

NEWS OF THE SOCIETIES

(Continued from page 271.)

tuted the main topic of discussion interest was manifested in methods of highway building as practiced in various parts of the State.

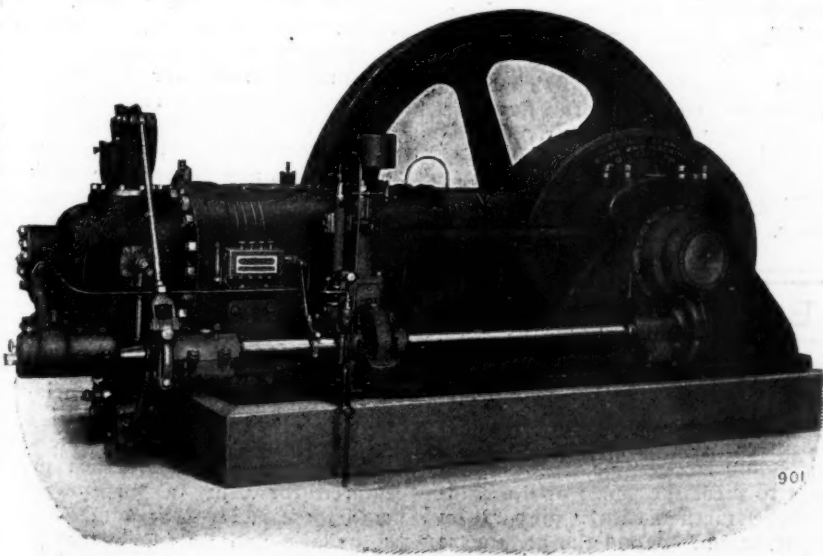
Mayor Clinton G. Brown, who delivered the address of welcome, invited

Delegates from the border counties, who outnumbered those of any other section of the State, are seeking to arouse effective interest in the movement to get the Federal Government to build a military highway along the Rio Grande.

Judge Will Van Rosenberg of Travis County advocated the enactment of a law against narrow wagon tires. Texas is the only State in the Union, he said, that has no law to protect its public roads. It is a poor economy, he declared, to spend money on roads without taking steps to prevent their destruction.

Unanimous indorsement of the "general provisions" of the so-called Tillotson bill, creating a State Highway Department, was the feature of the second day's session of the Texas Good Roads Congress. Though some of the minor provisions of the bill were not approved by any of the delegates, who expressed themselves on the subject, it was decided to place the Congress on record as approving the efforts as represented by the measure in the interest of good roads. After exhaustive discussion the bill was indorsed upon motion of Prof. T. U. Taylor, of the University of Texas. Especial emphasis was laid upon four features of the measure, namely, creation of a State Highway Commission; employment of a chief road engineer; establishment of a close union among the counties, and levying a tax on road vehicles, notably automobiles.

General objection was made to the provision in the bill limiting the salary of the chief engineer to \$4,000 a year, the delegates believing this amount too small to attract a high-class engineer, but the hope was expressed that the legislators may adopt a more liberal policy when the bill comes up for con-



NATIONAL TRANSIT HORIZONTAL DIESEL TYPE ENGINE

sideration at the next session of the Legislature.

Following adjournment of the convention proper, the Meridian Road Association elected officers. D. E. Colp of San Antonio was chosen president. The other offices were filled as follows: W. A. Barlow, Taylor, first vice-president; C. B. Monday, Marlin, second vice-president; C. C. Gumm, Fort Worth, secretary-treasurer. The election of the Southern National Highway Association, and the Puget Sound and Gulf Highway Association were postponed indefinitely.

The congress passed a series of resolutions, principal among which were those urging the Legislature to create a State highway commission, advocating the use of wide tires on wagon wheels, asking for an amendment to the State Constitution allowing the voting of special bonds for the maintenance of roads after they are built, and asking that the constitutional provision requiring a two-thirds majority for an issuance of road bonds be so amended as to allow the issuance of such bonds by a simple majority vote.

The congress also went on record as favoring the building of the proposed Old Spanish Trail Highway, and recommended that "the Constitution of this state be so amended as to allow counties or road districts to vote a special tax of not exceeding 50 cents on the \$100 valuation in said counties or districts for permanent road construction in addition to the right given by the Constitution to vote bonds in such counties."

National Paving Brick Manufacturers' Association.

The National Paving Brick Manufacturers' Association has arranged the details necessary for a study and conference in brick pavement construction, to take place Friday, October 6, at Paris, Ill.

Headquarters of the occasion will be the Deming Hotel, Terre Haute, Ind., from which place those participating will go via Interurban railway to Paris, Ill.—an hour's ride—where the construction demonstration, which will consist largely of steps showing the economy of construction and details in building a brick pavement by laying the brick in green mortar will take place. An important purpose of the demonstration will be to show how such a pavement can be built with the least possible cost and yet maintain all the essentials of worth.

All persons connected in any way officially or those deeply interested in the roads of this country will be made welcome at this conference. Members of the American Society of Municipal Improvements on their way to the annual meeting of that society can spend October 6 at this conference and reach Newark the following Monday.

The conference will be characterized by a critical study of what may be seen in every phase of the construction and the finished pavement. All those expecting to take advantage of this opportunity

are requested to notify the secretary of the association, Will E. Blair, Cleveland, Ohio, in order that they may be fully informed of the program, arrival and departure of trains, etc.

Michigan Association of City Clerks.

The Michigan Association of City Clerks held its sixth annual convention at Bay City August 18 and 19, and adopted a resolution recommending that the absent voters' law be amended to include qualified electors. This would especially benefit railroad men and tourists.

The meeting was devoted to a discussion of the proposed revision of the election law. The proposal urges that all obsolete laws now on the statute books be done away with. The legislative committee having this matter in charge was chosen as follows: Herbert S. Gray, Saginaw; C. M. Vodd, Jackson, and R. M. Ford, Highland Park.

The following officers were elected: President, C. L. Miller, Kalamazoo; first vice-president, Lovel V. Grant, Bay City; second vice-president, M. Tellman, Muskegon; secretary-treasurer, Herbert S. Gay, Saginaw. Mt. Clemens was chosen as the place for the next convention.

New York State Firemen's Association.

The annual convention of the Firemen's Association of the State of New York was held at Rockaway Beach August 15 and 16, having been transferred to that place from White Plains because of the action of the health authorities of Westchester county in view of the poliomyelitis epidemic.

The place for the 1917 convention will be chosen by the executive committee. The following officers were elected: John Sells, Yonkers, president; John J. Mahaney, Lockport, first vice-president; Archer B. Wallace, Freeport, second vice-president; John P. Powers, Ossining, treasurer, and Thomas Hanohan, Frankfort, secretary. The three members elected to the board of trustees are: Samuel H. Williams, Rochester; Daniel Bradley, New York, and William Frank, mayor of Poughkeepsie. The new members of the executive committee are: Michael J. Daly, Mechanicville, for a full five-year term, and John C. Hottinger, of Buffalo, to fill the unexpired term of Chief Fred H. Wilson, of Jamestown, who was killed in an automobile accident last year.

books on surveying assume the student to have completed at least the elements of algebra, plane and solid geometry, trigonometry and analytic geometry. But there are many who have not mastered these subjects. It is for these, for students in night schools and high schools and for self-taught men in the employ of surveyors that this book is written.

The author starts with 14 pages of introduction in which elementary principles of surveying are discussed and an outline of methods given. Some of the simpler tools are described. Following are 69 pages which are devoted to chain surveying. In this section various surveying problems of a simple nature are taken up and the student gets his first taste of geometry and mensuration, which are introduced in an elementary form. The elements of leveling, including the adjustment of the level, are discussed in 28 pages, after which the author takes up compass surveying. Methods of making and closing traverses, adjusting errors and other everyday surveying work are treated here and much good advice is given for the student.

Trigonometry is now taken up in earnest and the student is given the foundations of this branch of mathematics and enough of the general subject to enable him to handle most of the problems that he will meet in regular surveying practice. This is followed by a chapter in transit surveying. A large amount of space is devoted to this work, as is proper, and every branch is taken up thoroughly. The use of the vernier is discussed and the method of using it explained. Principal transit adjustments and the reasons for making them are described. Stadia work is taken up to some extent, as is topographical work and map-making. These are treated more fully later. A stadia reduction table is given and practical astronomy is discussed.

This book, while useful for all who use a compass, level or transit, is written more especially for land surveyors than for civil engineers on construction or preliminary work. As is proper, therefore, as being of interest to the majority of the readers, considerable space is given over to a discussion of the principles of surveying law and practice. The book closes with a chapter on engineering surveying, which includes stadia and plane table work and mining and hydrographic surveys. There is an appendix which is given over to the presentation of the essentials and principles of algebra. A few simple problems are given.

The book is readable and well prepared and should fill a want that has not been met by any other book on the subject. Though prepared primarily for the non-technical man who has not had the chance to become well grounded in the mathematics usually required for using a surveying textbook, there is much of value in it for the college man and the recent graduate will find it especially handy when he takes up surveying work of any sort.

BOOK REVIEW

PRACTICAL SURVEYING: By Ernest McCullough. 400 pages. Illustrated. D. Van Nostrand Company, N. Y. Price \$2.

This book, the author states, is an attempt to meet the needs of the student whose mathematical preparation does not extend beyond the arithmetic given in the grade schools. In this the book stands alone, for all other text

ADVANCE CONTRACT NEWS

ADVANCE INFORMATION BIDS ASKED FOR

CONTRACTS AWARDED ITEMIZED PRICES

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS.				
O.	Columbus	noon, Sept.	2..Levee work, requiring 2,000 cu. yds. excavation and 650 sq. yds. macadam road	John Scott, Clerk, Co. Comrs.
O.	Marion	noon, Sept.	2..3,000 ft. macadam road	V. P. Garfield, Clk., Co. Comrs.
O.	Brookside	Sept.	2..Paving Brookside Ave.	W. C. Fawcett, Engineer, Martins Ferry, O.
O.	Cleveland	10 a.m., Sept.	2..Constructing county road	E. G. Krause, Clk., Co. Comrs.
O.	Norwalk	noon, Sept.	2..Monolithic paving and grading	W. B. French, Dir. Pub. Ser.
O.	Circleville	noon, Sept.	2..1,800 ft. brick paving with concrete curb	W. F. Baker, Dir. Pub. Ser.
Ky.	Frankfort	Sept.	2..1.55 miles turnpike construction	S. B. Smith, Road Engr.
Mont.	Billings	10 a.m., Sept.	2..Grading several roads	F. E. Williams, Clk. Co. Comrs
Cal.	Ventura	Sept.	2..Grading 14 miles of road	C. W. Pettitt, Co. Engr.
Ia.	Sioux City	10 a.m., Sept.	2..Paving several streets	City Engineer
Minn.	Jenkins	9 a.m., Sept.	2..Ditching and constructing roads	A. J. Olson, Town Clerk.
Ill.	Steger	8 p.m., Sept.	4..Laying concrete sidewalk	J. D. Scheiwe, Village Clerk.
Cal.	Newport Beach	Sept.	4..Concrete pavement, curbs, etc.	City Clerk
Mo.	Girardeau	Sept.	4..Paving 4 blocks with concrete	R. T. Frissel, City Clerk.
Mo.	Carthage	Sept.	4..Paving several streets	F. B. Newton, Engineer.
Miss.	Grenada	noon, Sept.	4..Constructing several roads	M. E. Powell, Clk., Co. Supvrs.
Pa.	Darby	8 p.m., Sept.	4..Grading and paving roadways	A. F. Damon, Jr., Boro. Engr.
Miss.	Chickasaw	Sept.	4..8 miles gravel road; \$33,000 available	M. D. Smith, Engineer, Kosciusko, Miss.
Miss.	Greenwood	noon, Sept.	4..Two auto trucks, trailers, road roller and gravel loading machine and other road equipment	A. R. Bew, Clk. Bd. Supvrs.
Ind.	Salem	1:30 p.m., Sept.	4..Four miles road construction	F. P. Morris, Co. Aud.
Ind.	Fowler	1 p.m., Sept.	4..Constructing township road	Warren Mankey, Co. Aud.
Ind.	Paoli	2 p.m., Sept.	4..Constructing two roads	E. A. Palmer, Co. Aud.
Miss.	Clarksdale	2 p.m., Sept.	4..80 miles of gravel road	L. W. Washburn, Engr.
Ind.	Shoals	Noon, Sept.	4..Constructing 2 roads	L. D. Haga, Co. Aud.
Ind.	Bloomington	Sept.	4..Constructing county road	County Auditor.
Pa.	Hughesville	noon, Sept.	4..5,000 sq. yds. permanent pavement	W. C. Fulmer, Boro Secy.
Ind.	Jeffersonville	10 a.m., Sept.	4..Constructing stone road	G. W. Stoner, Co. Auditor.
Ind.	Newport	10 a.m., Sept.	4..Constructing gravel road	Roy Slater, Co. Auditor.
Ind.	Greensburg	1 p.m., Sept.	4..Constructing several roads	J. C. Barbe, Co. Auditor.
Ind.	Nashville	1 p.m., Sept.	4..Constructing three gravel roads	Oliver Morrison, Co. Auditor.
Ind.	Valparaiso	2 p.m., Sept.	4..Constructing gravel road	C. A. Blachly, Co. Auditor.
Ind.	Vernon	11 a.m., Sept.	4..Constructing crushed stone road	G. J. Bernhart, Co. Auditor.
Ind.	Hartford City	2 p.m., Sept.	4..Constructing township road	J. L. McGeath, Co. Aud.
Ind.	Rensselaer	2 p.m., Sept.	5..Constructing two stone roads	J. P. Hammond, Co. Aud.
Ind.	Washington	2 p.m., Sept.	5..Constructing gravel road	J. G. Clark, Co. Aud.
Ind.	Cannelton	noon, Sept.	5..Constructing stone road	M. C. Conway, Co. Auditor.
O.	Cleveland Heights	noon, Sept.	5..Brick, asphalt or macadam paving	F. A. Pease Engr. Co., Marshall Bldg., Cleveland, O.
Ind.	Angola	1 p.m., Sept.	5..One mile cement and one-half mile gravel roads	F. C. Dewey, Co. Auditor
Ind.	Delphi	Noon, Sept.	5..Constructing roads	H. D. Good, Co. Aud.
Ind.	Bedford	1 p.m., Sept.	5..Gravel or macadam roads	E. W. Edwards, Co. Aud.
Ind.	English	2 p.m., Sept.	5..Constructing roads	J. B. Enlow, Co. Aud.
Ind.	Columbia City	Noon, Sept.	5..Constructing two roads	T. A. McLaughlin, Co. Aud.
Miss.	Holly Springs	Sept.	5..9.9 road construction, including 79,000 cu. yds. excavation	S. W. McCleskey, Engr., 11 S. 2d St., Memphis, Tenn.
Miss.	Holly Springs	Sept.	5..Two miles concrete road, 34 miles gravel road, 35 miles sand-lay road and 2,670 cu. yds. bridge concrete, cost \$262,000.	W. G. Kirkpatrick, Engr., Farley Bldg., Birmingham, Ala.
Ind.	Vincennes	2 p.m., Sept.	5..Three miles of gravel road	J. Muentzer, Co. Aud.
S. D.	Brookings	2 p.m., Sept.	5..Five road graders	F. H. Ripley, Co. Aud.
Ind.	Albion	2 p.m., Sept.	5..Constructing gravel road	G. A. Young, Co. Aud.
Ind.	Bloomington	3 p.m., Sept.	5..Two gravel roads	W. Kinser, Co. Aud.
Ind.	Petersburg	2 p.m., Sept.	5..Constructing rock road	John Gray, Co. Aud.
Cal.	Stockton	10 a.m., Sept.	5..Improving Norton-Anglers road	E. D. Graham, Clk., Bd. Supvs.
Ind.	Greenfield	10 a.m., Sept.	5..Constructing gravel roads	H. J. Rhue, Co. Auditor.
N. D.	Bowbells	2 p.m., Sept.	5..Grading and bridge work	G. K. Melby, Co. Auditor.
N. J.	Westfield	8 p.m., Sept.	5..4,500 sq. yds. macadam and 2,300 ft. concrete curb and gutter	A. W. Vars, Town Engineer, Westfield.
O.	Niles	noon, Sept.	5..Paving with brick, asphalt or wood	H. A. Burgess, Dir. Pub. Ser.
Minn.	St. Paul	10:30 a.m., Sept.	5..Grading several streets	H. W. Austin, Pur. Agt.
Ind.	Rockville	11 a.m., Sept.	5..Constructing gravel road	C. Davis, Co. Aud.
N. Y.	New Brighton	noon, Sept.	5..12,600 sq. yds. concrete pavement	C. D. Van Name, Boro Pres.
Md.	Baltimore	noon, Sept.	5..9.74 miles state highways	State Road Commission.
N. J.	Hackensack	Sept.	5..Improving Belleville turnpike	T. J. Wasser, County Engr.
N. J.	Plainfield	Sept.	5..Improving and macadamizing	A. J. Gavett, City Engineer.
Minn.	Albert Lea	Sept.	5..Constructing 7,200 ft. concrete curb	C. J. Dudley, City Clerk.
N. J.	N. Arlington	.8 p.m., Sept.	5..2,160 ft. bluestone curb	W. H. Hoff, Engr., 90 Morgan Road.
O.	Bedford	Sept.	5..Grading, curbing and paving streets	H. T. Hubbell, Village Clerk.
Ky.	Covington	10 a.m., Sept.	5..63,000 sq. yds. macadam or glutin surfacing; scarifying and reconstructing	J. B. Dillon, Clerk, Co. Court.
N. J.	So. Orange	7:30 p.m., Sept.	5..1,800 sq. yds. belgian block gutters, 5,500 ft. concrete curb and 7,500 sq. ft. concrete walks	I. T. Redfern, Village Engr.
Miss.	Starkville	8:30 a.m., Sept.	5..5,000 sq. yds. asphalt macadam	E. C. Thomas, Engr., Nash Bld.
Pa.	Conemaugh	5 p.m., Sept.	5..Brick pavements and concrete curb and walk	O. P. Thomas, Boro Engr., Leader Bldg., Johnst'n, Pa.
Cal.	Bakersfield	Sept.	5..17 miles grading and paving with broken stone	Board of Supervisors
Wash.	Wenatchee	Sept.	5..Constructing 2 miles of highway	T. L. Ross, Co. Aud.
N. J.	Bloomfield	8 p.m., Sept.	5..5,000 tons broken stone	R. F. Davis, Town Clerk.
N. Y.	Buffalo	11 a.m., Sept.	5..Paving and repaving several streets	A. W. Kreinheder, Comr. of Public Works.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Ill.	Pekin.....	2 p.m., Sept.	5..36,700 sq. vds. brick pavement, 13,300 ft. sandstone curb, etc., cost \$75,000.....	Board of Local Improvements.
Minn.	Duluth.....	11 a.m., Sept.	5..Improving Sixth avenue.....	J. A. Farrell, Com'r of Pub. Works.
Minn.	Park Rapids.....	Sept.	5..Grading 4 miles of road.....	C. E. Spencer.
Pa.	South Fork.....	7 p.m., Sept.	6..2,625 sq. yds. vit. brick pavement.....	L. R. Owen, Boro Engineer, Otto Bldg., Johnstown, Pa.
Ind.	Huntington.....	2 p.m., Sept.	6..Constructing two roads.....	O. E. Eviston, Co. Aud.
Fla.	Ocala.....	Sept.	6..One or more trucks for tractor engines.....	W. D. Carn, Chmn. Co. Comra.
Ind.	Madison.....	1 p.m., Sept.	6..Three miles tarvia macadam; cost, \$17,500.....	C. S. Dibler, Co. Aud.
Ind.	Shelbyville.....	10 a.m., Sept.	6..Gravel and concrete road.....	F. W. Fagel, Co. Aud.
Ore.	Albany.....	Sept.	6..Constructing county road.....	J. R. Stannard, Co. Clerk.
N. J.	Mt. Holly.....	11:30 a.m., Sept.	6..16,800 sq. yds. macadam pavement.....	James Logan, Co. Engr.
Ind.	Indianapolis.....	10 a.m., Sept.	6..Paving streets and alleys.....	B. J. T. Jeup, City Engr.
Ind.	Auburn.....	10 a.m., Sept.	6..Constructing gravel road.....	S. P. Nelson, Co. Auditor.
Ore.	Harrisburg.....	Sept.	6..Constructing county road.....	County Clerk.
O.	Matamoras.....	Sept.	6..Brick and concrete paving.....	W. P. Mason, Engr., German Bank Bldg., Marietta, O.
Wis.	W. Milwaukee.....	8 p.m., Sept.	6..4,200 sq. yds. concrete pavement.....	S. J. Brew, Village Clerk.
Wis.	Greenfield.....	8 p.m., Sept.	6..4,200 sq. yds. reinforced concrete pavement.....	N. A. Jaeger, Town Clerk.
Md.	Baltimore.....	11 a.m., Sept.	6..Concrete paving on alleys.....	R. M. Cooksey, Hwys. Engr.
Ill.	Chicago.....	Sept.	6..Concrete paving on several streets.....	E. J. Glackin, Secy. Bd. Local Improvements.
Del.	Georgetown.....	1 p.m., Sept.	6..Concrete highway on Dupont Road.....	Chas. Upham, Chief Engr.
O.	New Concord.....	Sept.	6..11,600 sq. yds. brick and concrete pavement and 10,000 ft. of curb.....	T. C. Connor, Engr., Zanesville, O.
O.	Cleveland.....	noon, Sept.	6..Grading and paving two streets.....	Comr. of Engineering
Cal.	Santa Ana.....	Sept.	6..2 1/2 miles concrete pavement.....	W. B. Williams, Clk. Bd. Supvs
Wyo.	Casper.....	Sept.	6..17,000 sq. yds. bitulthic.....	L. D. Worthington, Engr.
Mo.	Cartersville.....	Sept.	7..Concrete paving, \$21,800 available.....	A. M. Baird, City Engr.
Miss.	Carthage.....	Sept.	7..17 miles sand-clay road.....	M. D. Smith, Engr., Kosciusko, Miss.
Cal.	Santa Barbara.....	Sept.	7..2 1/2 miles concrete and asphalt pavement.....	A. C. Holmberg, City Clerk
N. Y.	New York.....	10:30 a.m., Sept.	7..9,600 sq. yds. bit. con. pavement, 35,000 sq. yds. sheet asphalt, 2,200 sq. yds. asphalt block, concrete walks, etc.	Douglas Mathewson, Pres. Bronx Borough.
N. Y.	New York.....	3 p.m., Sept.	7..Laying concrete walks, filling and paving with asphaltic concrete.....	Park Board, Dept. of Parks.
N. J.	New Brunswick.....	2:30 p.m., Sept.	7..2,000 tons bituminous concrete mixture.....	A. B. Fox, County Engr., Perth Amboy, N. J.
N. J.	Newark.....	3:30 p.m., Sept.	7..15,000 sq. yds. wood block pavement, 6,000 ft. stone curb, concrete walk, etc.....	M. R. Sherrerd, Chief Engr.
Ind.	Warsaw.....	10 a.m., Sept.	7..Gravel or macadam roads.....	V. D. Mock, Co. Auditor.
Ind.	Rochester.....	2 p.m., Sept.	7..Constructing gravel road.....	E. A. Smith, Co. Aud.
Ind.	Corydon.....	2 p.m., Sept.	7..Gravel or macadam road.....	J. L. O'Bannon, Co. Aud.
Ind.	LaPorte.....	Sept.	7..Constructing two roads.....	County Auditor.
Ind.	Frankfort.....	2 p.m., Sept.	7..Constructing 4 gravel roads.....	Edw. Spray, Co. Auditor.
N. J.	Elizabeth.....	3:30 p.m., Sept.	7..350 sq. yds. sheet asphalt, 150 ft. bluestone curb.....	W. P. Neafsey, Street Comr.
Pa.	Carnegie.....	Sept.	7..Grading, paving and curbing.....	H. R. Bigham, Boro. Clk.
O.	Youngstown.....	noon, Sept.	8..Paving Milton Ave.....	Director of Public Service
Cal.	Ventura.....	Sept.	8..25,000 sq. yds. of paving, grading and culverts.....	County Supervisors
Ind.	Brazil.....	10:30 a.m., Sept.	8..Four stone roads.....	W. O. Graesser, Co. Aud.
Ind.	Indianapolis.....	10 a.m., Sept.	8..Paving and improving streets and alleys.....	B. J. T. Jeup, City Engr.
Ind.	Mt. Vernon.....	2 p.m., Sept.	8..1 mile of gravel road.....	J. R. Haines, County Auditor.
Wash.	Port Angeles.....	Sept.	8..13,000 sq. yds. concrete pavement and 7,000 ft. of curb.....	J. L. Beam, City Clerk
Ind.	Bluffton.....	Sept.	8..Paving with brick.....	City Clerk.
Ky.	Jenkins.....	5 p.m., Sept.	8..4,400 sq. yds. concrete pavement, 1,000 sq. yds. concrete walk, and 3,900 ft. concrete curb and gutter.....	Chief Engineer.
N. Y.	New Brighton.....	Sept.	8..7,020 sq. feet concrete sidewalk.....	Engineer, Bu. of Engineering.
Wis.	Racine.....	Sept.	9..1,400 ft. combined curb and gutter; grading streets.....	Board of Public Works.
Ill.	Sioux City.....	10 a.m., Sept.	9..Paving with concrete.....	Charles Kloster, City Clerk.
Ill.	Sandwich.....	7:30 p.m., Sept.	11..Curbing, sewers and paving with brick, cost \$13,600.....	W. S. Shields, Engineer, Hartford Bldg., Chicago, Ill.
Ia.	Vinton.....	noon, Sept.	11..7,600 cu. yds. road grading.....	W. E. Gilchrist, Co. Aud.
Ala.	Birmingham.....	noon, Sept.	11..Constructing Warrior River road.....	G. H. Clark, County Engr.
Ind.	Indianapolis.....	10 a.m., Sept.	11..Paving several streets.....	B. J. T. Jeup, City Engineer.
Neb.	Norfolk.....	5 p.m., Sept.	11..Street flusher, police patrol and fire truck.....	P. F. Stafford, City Clerk.
O.	Akron.....	11 a.m., Sept.	11..Grading and improving Wooster road.....	County Survr., Court House
O.	Mount Vernon.....	Noon, Sept.	11..Grading, curbing and paving several streets.....	City Engineer.
Minn.	Aitkin.....	1 p.m., Sept.	11..1.2 miles road construction.....	H. C. Beacher Co., Aud.
Pa.	S. Allentown.....	5 p.m., Sept.	11..Constructing concrete cross-walks.....	Lacom & Slegar, Boro Engneers, Allentown, Pa.
Ia.	Estherville.....	Noon, Sept.	12..Graveling 28 miles of road.....	R. J. Riley, Co. Aud.
O.	Bowling Green.....	1 p.m., Sept.	12..Grading and macadamizing.....	R. S. Gillespie, County Aud.
Mont.	Billings.....	Sept.	12..20,000 sq. yds. of paving, concrete or bit.....	E. M. Sneckenberger, City Engineer.
N. Y.	New Brighton.....	noon, Sept.	12..930 indestructible road signs.....	C. B. Van Name, Boro. Pres.
Ind.	South Bend.....	10 a.m., Sept.	12..Constructing sidewalk and curbs and resurfacing pavement.....	Board of Public Works.
La.	New Orleans.....	Sept.	12..53,000 sq. yds. hard surface pavement.....	W. J. Hardee, City Engr.
Ala.	Tuskegee.....	Sept.	13..Grading and graveling, cost \$5,000.....	County Commissioners.
N. J.	Westfield.....	8 p.m., Sept.	13..5,820 sq. yds. macadam roads, grading, and gravel paths.....	J. W. Higgins, Engr., 52 Vanderbilt Ave., N. Y. City.
O.	Springfield.....	noon, Sept.	14..Paving two streets.....	C. E. Ashburner, City Mgr.
O.	Lancaster.....	Sept.	14..Brick or asphalt block paving, curbs and sewers.....	G. B. Larimer, Dir. Pub. Ser.
Ind.	Indianapolis.....	10 a.m., Sept.	14..Sidewalks and curbs and street signs.....	Board of Park Comrs.
Ind.	Portland.....	2 p.m., Sept.	14..Brick and stone roads.....	John Bonifas, Co. Aud.
Ga.	Savannah.....	Sept.	14..14,000 bbls. Portland cement for highways.....	G. R. Butler, Co. Clerk.
Ind.	New Albany.....	10 a.m., Sept.	15..6,990 ft. road construction.....	Emile Dupaquier, Co. Aud.
Cal.	Los Angeles.....	Sept.	15..Laying asphalt pavement.....	Homer Hamlin, City Engineer.
O.	Zanesville.....	noon, Sept.	15..3,000 sq. yds. brick pavement and 2,500 ft. concrete curbs.....	H. A. Imlay, Supt. Park Com.
Wis.	Merrill.....	7:30 p.m., Sept.	15..Brick pavement and concrete curb.....	H. R. Allen, City Clerk.
Wis.	Elkhorn.....	3 p.m., Sept.	16..45,000 sq. yds. pavement, sewers, etc.....	A. G. Groesbeck, Chmn. Street Committee.
Ind.	Columbus.....	10 a.m., Sept.	16..Constructing three concrete roads.....	W. H. Scott, Co. Aud.
O.	Cleveland.....	10 a.m., Sept.	16..Wood floors for bridge.....	W. A. Stinchcomb, Co. Surv.
N. Y.	Albany.....	1 p.m., Sept.	18..Constructing and repairing state highways.....	Edwin Duffey, State Hy. Com.
Ia.	Red Lake.....	Sept.	18..21,000 cu. yds. of grading.....	C. D. Forsleach, City Engineer.
O.	Shaker Heights.....	noon, Sept.	19..Brick, concrete, asphalt or bituminous macadam pavem't.	B. W. Willard, Engr., Engineers' Bldg., Cleveland, O.
Wash.	Pasco.....	Sept.	19..Constructing permanent highways.....	J. W. Hamilton, Co. Engr.
Ala.	Rockford.....	Sept.	19..23 miles road construction.....	W. P. Moon, Co. Engr., Goodwater
La.	New Orleans.....	Sept.	19..26,350 sq. yds. hard surface pavement.....	W. J. Hardee, City Engr
Ala.	Scottsboro.....	Sept.	20..Limestone macadam road, cost \$4,000.....	County Commissioners
Ariz.	Phoenix.....	Sept.	20..12,200 sq. yds. pavement.....	J. B. Girard, City Engineer.
Cal.	Santa Barbara.....	Sept.	21..Paving 2 miles of road (oil and screenings).....	A. B. Cook, City Engineer.
Ind.	Lebanon.....	Sept.	25..7 blocks brick pavement, curb, etc.....	Walter Whitecotton, Engr.
La.	New Orleans.....	Sept.	26..39,000 sq. yds. hard surface pavement.....	W. J. Hardee, City Engr.
La.	New Orleans.....	Sept.	29..61,250 sq. yds. hard surface pavement.....	W. J. Hardee, City Engr.
Cal.	Bakersfield.....	Oct.	3..10 miles stone road.....	Board of Co. Supervisors

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
SEWERAGE.				
Wis.	Appleton	9 a.m., Sept.	2..300 ft. 9-inch sewers	A. C. Remley, City Engr.
Ind.	Riceville	Sept.	4..5,000 ft. 8 to 12-in. sewer and disposal plant	H. A. Yager, City Clerk.
Ind.	Alexandria	Sept.	4..Constructing sewers	City Clerk.
N. J.	South Orange	8 p.m., Sept.	5..1,200 ft. of 8-in. sewer	E. R. Arcularius, Twp. Clerk.
Minn.	Slayton	2 p.m., Sept.	5..Tile ditches; cost, \$10,000	E. V. O'Brien, County Aud.
Minn.	Slayton	10 a.m., Sept.	5..Tile ditches; cost, \$38,400	E. V. O'Brien, County Aud.
D. C.	Washington	2 p.m., Sept.	5..950 ft. 24x36 to 84x108-in. sewers	Chief Clerk, Engineer Dept., District Building
O.	Cleveland Heights	noon, Sept.	5..Storm and sanitary sewers	F. A. Pease Engr. Co., Marshall Bldg., Cleveland, O.
O.	Elyria	noon, Sept.	5..Constructing sanitary sewers	M. M. Wilcox, Dir. Pub. Serv.
Cal.	Fresno	Sept.	5..52,000 ft. 16 to 60-in. sanitary sewers, cost \$400,000	B. E. Cronkite, City Engr.
N. J.	South Orange	8 p.m., Sept.	5..1,200 ft. 8-in. sewer, manholes and flush tanks	E. R. Halsey, Twp. Engr.
Texas	Huntsville	8 p.m., Sept.	5..Sanitary sewer system	N. Griffin O'Neill & Sons, Praetorian Bldg., Dallas
Minn.	St. Paul	10.30 a.m., Sept.	5..Constructing several sewers	H. W. Austin, Pur. Agent.
Ind.	Denison	Sept.	5..500 ft. 36-in. sewer	Frank Woolston, City Engr.
Mass.	Boston	noon, Sept.	5..Pipe sewers and drains	E. F. Murphy, Comr. of Public Works.
Mich.	Muskegon	Sept.	5..4,400 ft. tile, cost \$5,700	T. L. Grimes, Engineer.
Cal.	Riverside	Sept.	5..5,600 ft. 6 to 14-in. vit. sewers	City Engineer
Minn.	Litchfield	8 p.m., Sept.	5..900 ft. 8-in. sewer	F. O. Holm, Recorder.
Ind.	Evansville	9 a.m., Sept.	5..15-in. local sewer	E. M. Frisse, C'k, Bd. Pub. Wk.
Pa.	South Fork	7 p.m., Sept.	6..1,200 ft. 12 to 24-in. storm sewer construction	L. R. Owen, Boro Engineer, Otto Bldg., Johnstown, Pa.
Mich.	Ann Arbor	7.30 p.m., Sept.	6..9,000 ft. 8 and 10-in. vit. tile sewers	Manley Osgood, City Engr.
Ind.	Decorah	7.30 p.m., Sept.	6..Sewers in several streets	F. M. Hughes, City Clerk.
Neb.	Bridgeport	noon, Sept.	6..1,375 ft. 6 and 8-in. sewer	C. B. Perry, Village Clerk.
Conn.	Bridgeport	2 p.m., Sept.	6..9,400 ft. 60 to 72-in. sewers	A. H. Terry, City Engr.
Kan.	Downs	5 p.m., Sept.	7..Sewer system and disposal plant	E. T. Archer & Co., Engineers, New England Bldg., Kansas City, Mo.
Ill.	Rockford	1.30 p.m., Sept.	7..Laying sewer on Greenwood avenue	City Engineer.
O.	Toledo	Sept.	7..16 miles sanitary sewer	Gabe Cooper, Co. Aud.
N. Y.	New York	10.30 a.m., Sept.	7..Constructing sewers in several streets	Douglas Mathewson, President Bronx Borough.
Ind.	Dubuque	Sept.	7..Constructing 8-in. sanitary sewer	J. J. Shea, City Recorder.
N. Y.	New York	2 p.m., Sept.	8..Altering and improving Dyckman street outlet sewer	Comr of Public Works, Bureau of Sewers.
Minn.	Litchfield	2 p.m., Sept.	8..12,700 ft. 8 to 16-in. tile drainage ditch	A. O. Palmquist, Co. Aud.
O.	Stuebenville	Sept.	9..Constructing sanitary sewer	Seth Williams, Ck. Bd. Educ.
S. D.	Brookings	Sept.	11..3,600 ft. of sewer	Dakota Engineering Co., Mitchell, S. D.
N. D.	Bismarck	8 p.m., Sept.	11..Constructing lateral sewers	R. H. Thistlethwaite, City Aud.
Ill.	Sandwich	7.30 p.m., Sept.	11..Sewer pipe, inlet, etc.; storm drains	W. S. Shields, Engineer, Hartford Bldg., Chicago, Ill.
N. J.	Bay Head	8 p.m., Sept.	11..Sewer system and disposal plant	Remington & Vosbury, Engrs., Market St., Camden, N. J.
O.	Hyatts	noon, Sept.	11..Septic tank, filter beds, tile, etc.	D. S. Schureman & Son, Delaware, O.
Ind.	Boone	Sept.	11..11,000 ft. 6 to 16-in. tile drain	J. R. Curry, Co. Aud.
Minn.	Winthrop	5 p.m., Sept.	11..7,600 ft. 8 to 15-in. sewers	F. B. Minium, Engineer, New Ulm, Minn.
Wis.	Mosinee	Sept.	11..Furnishing material and constructing sewer	E. H. Viele, Clerk.
Mont.	Billings	Sept.	12..Storm sewers and street work	E. M. Sneckenberger, City Engineer.
O.	Middletown	noon, Sept.	12..Tile storm and sanitary sewers	City Commission
Ind.	South Bend	10 a.m., Sept.	12..Pipe sewers on several streets	Board of Public Works.
Pa.	Monongahela	Sept.	14..1,350 ft. 10 to 18-in. sewers; catch-basins	M. G. Borland, Engr.
Minn.	Cambridge	Sept.	14..Drainage ditches, cost \$29,000	G. C. Smith, Co. Aud.
Ind.	Fort Dodge	1.30 p.m., Sept.	14..14,800 ft. 7 to 28-in. tile drain, cost \$12,000	D. W. Gibbs, Engineer.
Pa.	Meadville	Sept.	15..3,300 ft. 8-in. sanitary sewer	B. F. Miller, Jr., City Engr.
O.	Lancaster	Sept.	15..Complete storm and sanitary sewer system	G. B. Larimer, Dir. Pub. Ser.
Cal.	Hermosa Beach	Oct.	15..Disposal plant, cost \$27,000	C. R. Sumner, City Engr.
O.	Cleveland	10 a.m., Sept.	16..Constructing sewers in several streets	Co. Engr., New Court House.
O.	West Chester	Sept.	16..Septic tank and filter beds at school	A. Kloman, Clerk, Bd. Education.
Wis.	Elkhorn	Sept.	16..6,000 ft. 8 to 24-in. storm sewers, 31 catch-basins, and 25 manholes	A. G. Groesbeck, Chmn. Street Committee.
O.	Cleveland Heights	noon, Sept.	18..Storm water and sanitary sewers	F. A. Pease Engineering Co., Marshall Bldg., Cleveland, O.
Pa.	S. Bethlehem	8 p.m., Sept.	18..Constructing sewers and disposal plant	Boro Engineer
O.	Cleveland	noon, Sept.	19..Storm water and sanitary sewers at Shaker Heights	B. W. Willard, Village Engr., Engineers' Bldg., Cleveland.
Ill.	Cairo	Sept.	25..Repairing sewers	Geo. Dewey, Engineer.
WATER SUPPLY.				
Ill.	Chicago	Sept.	2..Two boiler feed pumps, complete	W. R. Moorhouse, Comr. of Pub. Works.
Neb.	Tilden	Sept.	2..Extending and constructing water mains	City Clerk.
Ind.	Richmond	11 a.m., Sept.	4..Water supply system at county farm	L. S. Bowman, Co. Aud.
S. D.	Mobridge	9.30 p.m., Sept.	4..Constructing watermain	A. L. Moss, Co. Aud.
Minn.	Hopkins	11.30 p.m., Sept.	5..1,650 ft. 6 and 8-in. water mains	E. A. Close, Recorder.
Wash.	Uniontown	Sept.	5..Furn. and lay. 1,400 ft. high pressure mains, complete	P. W. Busch, Town Clerk.
La.	Shreveport	10 a.m., Sept.	5..Constructing pumping station and filtration softening plant	J. B. Hawley, Consulting Engr., City Hall.
Ill.	Beardstown	2 p.m., Sept.	5..Pumping plant, pumps, etc.	C. O. Garm, Secy., Drainage District.
O.	Cleveland Heights	Sept.	5..Constructing water mains	H. H. Canfield, Clerk.
N. Y.	New York	11 a.m., Sept.	5..Furnishing and installing controlling mechanism for valves in Catskill aqueduct (city tunnel)	Principal Assistant Engineer, Board of Water Supply.
Minn.	St. Paul	10 a.m., Sept.	5..Electric motor control for deep well at Boys' Farm at Highwood	G. J. Ries, County Auditor.
N. Y.	New York	2 p.m., Sept.	5..Hauling and laying water mains	Corporation Counsel, Municipal Bldg.
S. D.	Chamberlain	Sept.	5..Constructing artesian well	H. Duval, Engineer.
O.	Rocky River	Sept.	5..Laying water mains	Frank Mitchell, City Clerk.
Ill.	Palatine	Sept.	5..Constructing and extending water mains	C. D. Taylor, Secy. Bd. Local Improvements.
Mass.	Boston	noon, Sept.	5..Furnishing compound elevator pump	R. A. Lynch, Supt. Pub. Bldgs.
N. Y.	Mt. Morris	1 p.m., Sept.	5..13,100 ft. 10-in. c. i. pipe and specials	C. C. Hopkins, Engr., Cutler Bldg., Rochester, N. Y.
Del.	Wilmington	10.30 a.m., Sept.	6..Two 9,000,000-gallon and one 12,000,000-gallon steam turbine-driven centrifugal pumps	Edgar M. Hoopes, Jr., Chief Engr.
N. D.	Fargo	10 a.m., Sept.	6..Laying two water mains	City Auditor.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
O., Youngstown	.....noon, Sept.	8..	Centrifugal air compressor and motor.....	Director of Pub. Service
Ill., Evanston	.....Noon, Sept.	8..	Constructing steam pumping unit, 10,000,000 gallons capacity.....	I. C. Brower, Comr. of Pub. Works.
S. D., Brookings	.....Sept.	11..	700 ft. lead service main.....	City Clerk.
Neb., Lincoln	.....2 p.m., Sept.	12..	Two centrifugal motor pumps; cost, \$5,500.....	T. H. Berg, City Clerk.
Minn., Sauk Center	.....Sept.	12..	Addition to waterworks system; resetting and furnishing pumps; pole line and "white way".....	J. F. Cooper, City Clerk.
N. Y., New York	.....11 a.m., Sept.	12..	Grouting 4,000 ft. of East View tunnel of the Catskill Aqueduct.....	Principal Assistant Engineer, Board of Water Supply.
Minn., Thief River Falls	.....Sept.	12..	3,730 ft. 6-in. mains.....	A. H. Fasel, City Clerk.
Miss., Brookhaven	.....Sept.	12..	Constructing deep well.....	A. D. Furlow, City Clerk.
Minn., Staples	.....8 p.m., Sept.	12..	200,000 gal. reservoir, etc.....	F. W. Findsen, City Clerk.
Neb., Dannebrog	.....7 p.m., Sept.	15..	Constructing water works system.....	J. P. Jacobson, City Clerk.
Ill., Ladd	.....Sept.	15..	Sinking well; cost, \$8,000.....	Village Clerk.
O., Shaker Heights	.....noon, Sept.	19..	Laying water mains.....	B. W. Willard, Village Engr., Engineers' Bldg., Cleveland.
Argentina, Buenos Aires	.....Oct.	13..	59,000 metric tons c. i. pipe and specials.....	Obras Sanitarias de la Nacion.
MISCELLANEOUS.				
Minn., Buffalo	.....1 p.m., Sept.	2..	Drainage ditches, cost \$14,000.....	J. C. Van Krevelen, Engineer, Watertown, Minn.
Ark., Alicia	.....Sept.	4..	Drainage work; cost, \$23,000.....	Drainage Commissioners.
S. C., York	.....Sept.	4..	860,000 cu. yds. ditch excavation.....	W. D. Alexander, Engineer, Charlotte, N. C.
N. J., Orange	.....Sept.	5..	Collection and disposal of garbage and ashes.....	Daniel F. Minihan, Mayor.
Miss., Gulfport	.....Sept.	5..	Constructing sea wall; cost, \$200,000.....	City Engineer.
Minn., St. Paul	.....10.30 a.m., Sept.	5..	850 bbls. Portland cement, crushed stone, etc.....	H. W. Austin, Pur. Agent.
O., Springfield	.....noon, Sept.	5..	Constructing municipal garage.....	C. E. Ashburner, City Mgr.
Tenn., Memphis	.....Sept.	5..	2,655,000 cu. yds. of earth work.....	U. S. Engineer's Office.
Minn., Gibbon	.....Sept.	5..	Repairing and painting water tanks.....	C. W. Carlson, Village Clerk.
La., Mason City	.....2 p.m., Sept.	5..	Constructing drainage ditch.....	G. E. Frost, Co. Aud.
Ind., Shelbyville	.....10 a.m., Sept.	6..	Reinforced concrete retaining wall; reinforced concrete bridge floor.....	F. W. Tagel, County Auditor.
Miss., Belzoni	.....11 a.m., Sept.	6..	21,000 cu. yds. of levee work.....	C. E. Downing, District Engr.
N. Y., Albany	.....noon, Sept.	6..	Dock wall on barge canal at Lyons, N. Y.....	W. W. Wotherspoon, St. Supt. Pub. Works.
Tenn., Memphis	.....Sept.	7..	50,000 sacks Portland cement.....	Drainage District, Mississippi River Commission, U. S. Engineer's Office.
La., New Orleans	.....noon, Sept.	13..	Two 15-ton traveling cranes.....	Sewerage & Water Board.
D. C., Washington	.....3 p.m., Sept.	20..	Installing refuse destructor at Freedmen's Hospital.....	Secretary of the Interior
La., New Orleans	.....Sept.	20..	Furnishing and delivering 52,000 tons rock.....	U. S. Engineer's Office.

STREETS AND ROADS

Tucson, Ariz.—Portions of Second St. and Eighth Ave. are to be improved and bonds will be issued to pay for improvement.

Sacramento, Cal.—The movement to secure Federal aid for the construction of a highway down the Salmon River in Trinity county was endorsed by the Eureka Promotion Association. The construction of a state highway lateral from Colusa, Colusa county, to Nevada City, Nevada county, via Marysville and Yuba City, is being advocated by a committee of representative citizens from the counties interested.

Sacramento, Cal.—The Placer County Bank has purchased Auburn's paving bonds amounting to \$25,000.

San Francisco, Cal.—San Bruno road between Cortland Ave. and Silver Ave. is to be paved.

San Mateo, Cal.—Hayward Park is to be paved as a result of petition of residents.

Boulder, Colo.—Formal requests will soon be made by Commissioners of Boulder County for their share of \$86,000 appropriation for road building in Colorado this year under the recent Good Roads Act. Roads for which money will be asked are rural mail route out of Boulder in the Pleasant View district and star mail route road between Cardinal and Caribou, which is a part of new Arapahoe Pass road.

Denver, Colo.—Edw. H. Bennett, civic expert, has been engaged to make plans for improvement of city.

Waterbury, Conn.—City Engineer reports estimated cost of laying out Huntington Ave. from Thomaston to Watertown Aves. as \$15,000.

Washington, D. C.—\$1,000,000 will be spent for the construction of roads and trails in the national forests. The tentative allotments to the principal national forest states are as follows: Alaska, \$46,280; Arizona, \$59,795; Arkansas, \$11,194; California, \$140,763; Colorado, \$62,335; Idaho, \$108,010; Montana, \$69,901; Nevada, \$19,195; New Mexico, \$42,622; Oregon, \$127,794; South Dakota, \$8,115; Utah, \$40,982; Washington, \$91,733; Wyoming, \$40,566. In addition, a total of \$9,552 has been tentatively assigned to Florida, Michigan, Minnesota, Nebraska, North Dakota and Oklahoma, while the eastern states, Maine, New Hampshire, Virginia, West Virginia, North Carolina, South Carolina, Tennessee and Georgia, in which the govern-

ment is purchasing lands for national forests, have been allotted \$21,057.

Bartow, Fla.—Dillon, Thompson & Clay, New York, have purchased road bonds amounting to \$1,500,000, for hard surfaced roads in Polk County.

West Palm Beach, Fla.—Bond issues for \$200,000 and \$150,000, respectively, have been voted by the taxpayers of the road and inlet districts of this section of Palm Beach County for a deep water inlet entering Lake Worth from the ocean, four miles north of Palm Beach, and a highway across the Everglades. These amounts represent only the commencement of work on highway and inlet.

Atlanta, Ga.—Stewart Ave. from Whitehall to Dill Ave. is to be resurfaced.

Rome, Ga.—Floyd county will help Chattooga county to build a highway.

Boise City, Ida.—Municipal paving bonds amounting to \$29,285.91 are to be issued.

Chicago, Ill.—Fort Sheridan road is to be improved; government has appropriated \$20,000 for the work, which will be started soon.

Danville, Ill.—Preliminary plans for the first link of a cross state paved road connecting Chicago with the state capital and St. Louis have been made. As planned the road will follow the Wabasha and Champaign, Savoy, Monticello, Maroa, Decatur, Illinois, Springfield and southwest to the Missouri metropolis.

Galesburg, Ill.—Grand Ave. is to be paved, estimated cost \$46,512.28.

Plainfield, Ill.—Supervisors plan extensive repairs on the highways.

Bedford, Ind.—J. F. Wild & Co., have purchased gravel road bonds amounting to \$70,000.

Brownstown, Ind.—Meyer-Kiser Bank has purchased road bonds amounting to \$19,100.

Indianapolis, Ind.—J. F. Wild & Co. have purchased Delaware county road bonds amounting to \$48,000. Fletcher Bank has purchased Anderson City bonds amounting to \$35,000.

Indianapolis, Ind.—J. F. Wild & Co. have purchased Lawrence county road improvement bonds amounting to \$70,000. Mayer-Kiser Bank have purchased Jackson county highway bonds amounting to \$19,100. Breed, Elliott & Harrison have purchased Dubois county highway bonds amounting to \$27,000. American Mortgage Guarantee Co. have purchased

Shelby county bonds amounting to \$21,440.

Rochester, Ind.—Sealed bids will be received until Sept. 7 at 3 o'clock p. m. for road bonds amounting to \$15,500.

Williamsport, Ind.—Bid received for paving 5th St. with cement from Jos. Borders, local.

Grundy Center, Ia.—About 40 blocks of streets will be paved next year. The new paving will measure about 38,000 sq. yds., and the cost will be about \$75,000. Address President of the Board of Public Works.

Chanute, Kan.—Bids on street paving have been rejected as too high.

Scott City, Kan.—County Commissioners have let contracts for grading 24 miles of Kansas-Colorado Blvd. extending from eastern to western edge of Scott County.

Wichita, Kan.—An ordinance has been passed authorizing the paving, excavation, curbing and guttering on Central Ave. from Rutan Ave. to Clifton Ave.; also Central Ave. from Roosevelt Ave. to Bluff St.

Augusta, Ky.—First National Bank of Brooksville have purchased road bonds amounting to \$25,000 of the \$200,000 bond issue of Bracken county.

Warsaw, Ky.—Road improvement bonds will be issued amounting to \$50,000.

New Orleans, La.—Esplanade Ave. is to be paved.

Baltimore, Md.—A plan has been laid before the Maryland Roads Commission for the construction of a road between Annapolis and Washington, to be known as the National Defense Highway.

Boston, Mass.—State Highway Commission is considering constructing state highways of concrete.

Fitchburg, Mass.—City is considering the extension of Easton Ave. through the Pigeon Swamp district to N. Main St.

Merrimac, Mass.—A new state road is to be constructed to extend from the square to the post office in Merrimacport, at a cost of \$4,000.

Detroit, Mich.—Union Ave. entrance to Forest Park is to be widened to 100 ft.

Lansing, Mich.—East Lansing will issue paving bonds amounting to \$20,000.

Duluth, Minn.—Sixth Ave. will be paved from Seventh to Eleventh St.

Duluth, Minn.—The council has passed an emergency ordinance appropriating \$350 for the purchase of 200 sq. yds. of sandstone blocks for street repair work and the ordinance appropriating \$179 for the construction of approaches to the Mission Creek bridge.

Gilbert, Minn.—City council has decided to pave, curb, boulevard and construct storm sewers in several streets.

Little Falls, Minn.—Members of the County Board are considering the oiling of county roads.

Minneapolis, Minn.—See "Water Supply."

St. Cloud, Minn.—County Board is being urged to repair roads between Lank Center and Todd county line.

St. Paul, Minn.—Sealed bids will be received until 9 o'clock a. m., Sept. 20, at the town hall of Maple Hill, Cook county, for road and bridge bonds amounting to \$25,000. V. A. Anderson, town clerk.

Lexington, Miss.—Hibernia Bank & Trust Co., New Orleans, La., has purchased road bonds amounting to \$300,000.

Lucedale, Miss.—Road and bridge bonds amounting to \$90,000 will be issued.

Monticello, Miss.—A petition has been filed for a bond issue for construction of a gravel road over proposed Jefferson highway, connecting with Copiah county gravel roads.

Chillicothe, Mo.—Calhoun St. is to be graded, curbed and paved from east side of Sunset Ave. to east side of Grandview Ave.

Hannibal, Mo.—Bids received for curbing and guttering Union St. have been rejected and clerk has been ordered to readvertise.

Hannibal, Mo.—Resolutions have been passed providing for the paving and curbing of several streets.

Great Falls, Mont.—Cascade County is considering issuance of road bonds amounting to \$500,000.

Albuquerque, N. Mex.—Federal appropriation amounting to \$15,000 will be used to construct highway through Navajo Indian reservation.

Hastings, Neb.—Bonds amounting to \$50,000 will be issued for paving.

Hastings, Neb.—Bonds amounting to \$50,000 are to be issued for the completion of about 12 miles of street paving.

Camden, N. J.—An ordinance has been passed directing the paving of Princess Ave. from Wildwood Ave. to Park Blvd. with asphalt on an 8-in. foundation.

Caldwell, N. J.—Road bids have been rejected and work will be done by borough.

East Orange, N. J.—An ordinance has been passed providing for the laying of a concrete sidewalk on the easterly side of North Maple Ave., between Park and Springdale Aves.

Glen Ridge, N. J.—An ordinance has been passed authorizing the issuance of street paving bonds amounting to \$55,000.

Morristown, N. J.—Sealed bids will be received by Committee on Finance and Audit, of the board, Sept. 8, at 2 P. M., for purchase of improvement bonds not exceeding \$559,000. William H. Hosking, clerk.

New Brunswick, N. J.—Burnet St. will be paved later on account of storm sewer being constructed down the course of Miller's Brook, which crosses Burnet St. and would interfere with paving.

Passaic, N. J.—Bids on the Milvale-Greenwood Lake Rd. have been rejected as being too high.

Passaic, N. J.—Passaic Ave. is to be paved with sheet asphalt soon.

South Amboy, N. J.—Freeholders voted to use Warrenite for paving of several streets.

Trenton, N. J.—State Road Commissioner Stevens has announced the roads to be improved with the \$59,112 which the State will receive this year as its share of the money allotted by the Federal government to highway construction. The roads are: Springfield Ave., Cranford township; the Layton and Dingman's Ferry road, Sussex county; the Penns Grove and Malaga road, Salem county; the Brunswick Pike from Princeton to New Brunswick and the Essex and Middlesex Pike from Rahway to Metuchen.

Eastwood, N. Y.—Midler Ave. is to be paved with tarvia and asphalt by Harry Williamson, local.

Newburgh, N. Y.—Municipality is to construct a long retaining wall in connection with the proposed laying of a sidewalk on the south side of Broadway between the junction of the South Plank road and the Stroock Plush Mill.

In This Issue: Contract News

Roads and Streets.

108 new bids asked
134 proposed work items

Sewerage:

46 new bids asked
46 proposed work items

Water Supply:

21 new bids asked
59 proposed work items

451 advance news items, including "Miscellaneous"—all new and reliable, for the municipal works contractor. More municipal contract news than any other paper.

Municipal Journal Leads in Service to Contractors

Rochester, N. Y.—Several streets are to be repaved.

Rochester, N. Y.—First ordinances adopted as follows: Pardee St., brick pavement, \$8,250; Rosedale St., asphalt block pavement, \$18,000; Clifford St. storm water sewer, \$27,000; Indian St., sewer, walks and grading, \$11,500; Wisconsin St., sewer, walks and grading, \$11,500; Illinois St., sewer, walks and grading, \$11,500; Marion St., sewer, walks and grading, \$12,500; Morton St., walks and grading, \$1,000; Hartson St., walks and grading, \$500; Congress Ave., walks and grading, \$2,300; Arnold Park, care and embellishment, \$550; Troup St., resurfacing, \$9,300. Final ordinances adopted as follows: Gregory St. from South Ave. to Clinton Ave., asphalt pavement, \$6,900; Regent place, opening and extension, and Caroline St., asphalt resurfacing from South Ave. to Meigs St., \$6,100.

Schenectady, N. Y.—The board of supervisors have authorized the issuance of highway bonds amounting to \$100,000.

Utica, N. Y.—(See Miscellaneous.)

Dobson, N. C.—Road bonds amounting to \$30,000 are to be issued.

La Grange, N. C.—Bonds amounting to \$50,000 will be issued; street bonds \$10,000, and water, sewer and light bonds, \$40,000.

Wilkesboro, N. C.—Election will be held Sept. 16 to vote on issuance of road bonds amounting to \$250,000.

Wilmington, N. C.—More roads will be improved in Brunswick County.

Bismarck, N. D.—Board of County Commissioners has advertised for bids for more road machinery.

Centerburg, O.—Ohio National Bank of Columbus has purchased paving and sewer bonds amounting to \$15,212.

Cincinnati, O.—Ordinance has been passed providing for issuance of bonds amounting to \$57,700 for improving following streets: Eureka Ter., \$550; Warsaw Ave., \$26,000; Elland Ave., \$4,500; Parker St., \$540; Hess Ave., \$1,600; Dorchester Ave., \$1,510; 6th St., \$12,500; Kessler Ave., \$2,300; Louis Ave., \$8,200.

Cincinnati, O.—An ordinance has been passed providing for grading of Wayne St. from Dover St. to a point 179.6 ft. east of Symmes St.

Cincinnati, O.—City Engineer wants a bond issue of \$77,000 to be used to improve 7th, 9th, Richmond and Court Sts.

Columbus, O.—Sealed proposals will be received at the office of the board of county commissioners of Franklin county until 10 o'clock a. m., Sept. 18, for road bonds amounting to \$8,500. John Scott, Clerk.

Montgomery, O.—Sealed proposals will be received until noon, Sept. 15, for purchase of street repair bonds amounting to \$392.50. C. H. Ekermeier, clerk.

Napoleon, O.—Bonds amounting to \$21,600 will be issued to complete the Toledo-Napoleon road.

North Lewisburg, O.—Bonds will be issued for street repair and fire engine amounting to \$10,400.

Sandusky, O.—Campbell St. paving will be readvertised, including four materials, brick, sheet asphalt, concrete and bitulithic.

Springfield, O.—Engineer Hull has

been instructed to advertise for bids for improvement of Russell road in Adams township; estimated cost, \$1,452.

Springfield, O.—New First National Bank, Columbus, has purchased street paving bonds amounting to \$38,500.

Springfield, O.—The president of the commission has been authorized to borrow \$30,362.92 in anticipation of the collection of assessments to pay the property owners' share of the cost of improving Main St., Center St., East St., Lowry Ave. and Euclid Ave.

Urbana, O.—The estimate of the Hickory Grove gravel road is \$1,966.40, according to Engineer Hull.

Portland, Ore.—Bids for paving approaches to the Columbia River bridge will be called for by the interstate bridge commission within a few weeks. Specifications approved provide for bitulithic, asphaltic concrete No. 2, macadam and concrete pavements. Approaches will be paved to a width of 30 or 38 ft., according to bids.

Portland, Ore.—Specifications for the pavement of the Interstate bridge approach has been adopted by bridge commissioners. Advertisements for bids will be made soon. Bids are to be asked for on a 30-ft. pavement, a 38-ft. pavement and a 38-ft. pavement which includes two strips 10 ft. wide and one macadam strip 18 ft. wide. The materials are to be asphaltic macadam or concrete.

Roseburg, Ore.—Engineer B. J. Finch is inspecting proposed Crater Lake cut-off from Tiller to Trail Creek.

Allentown, Pa.—Bids for paving Spruce St. from Allen to Tilghman rejected as being too high.

Carlisle, Pa.—South College St. is to be paved.

Erie, Pa.—Engineering data for the grading of Parade St. south of 14th St. where the subway under the elevated tracks of the Pennsylvania and New York Central roads is to be constructed, has been prepared by City Engineer Lynch and is now in the hands of City Solicitor Duff. Mr. Duff is preparing an ordinance authorizing the work and inviting proposals.

Erie, Pa.—The street director has asked immediate action on the extension of Division St. across the tracks of the New York Central railroad and the Pennsylvania.

Pittsburgh, Pa.—Sealed bids will be received until 8 o'clock p. m., Sept. 7, for bonds amounting to \$125,000. Edgar W. Meyers, Secretary of Council.

Punxsutawney, Pa.—The paving of 4th St. is to be continued, which has been delayed on account of lack of laborers. Street will be brick paving block with cement filler, cement also to be used for curbing.

Wilkes-Barre, Pa.—Ordinance has been passed authorizing grading, curbing and paving of Academy St. from Main St. to Shawnee Ave.

Clarksville, Tenn.—Stewart county has voted against road bond issue amounting to \$200,000.

Knoxville, Tenn.—The commission has appropriated \$600 for rock and Magnolia Ave. between Castle and Mary Sts., this amount to be applied on the asphalt paving provided the citizens of Park City will pay the balance of the contract for paving. A contract has been signed with S. D. Cobb to grade the Hines Valley road from the workhouse to Clinton pike.

Austin, Tex.—(See Water Supply.)

Dallas, Tex.—City Engineer Hal Moseley expects to begin soon to make surveys for proposed grade crossing eliminations in North Dallas. The Katy grades will be separated at Lemmon and Maple Aves. and Cedar Springs road.

Denton, Tex.—Special meeting has been called for Aug. 28 to consider plans for \$200,000 bond issue for good roads.

El Paso, Tex.—An ordinance has been passed providing for the paving of Auge St., between Missouri and Crosby Sts., and Cotton Ave., between Wyoming and Erie St.

Fort Worth, Tex.—(See "Sewerage.")

Salt Lake City, Utah.—Bids for construction of two miles of hard surface road were rejected as too high.

Norfolk, Va.—A resolution has been passed appropriating \$217,469.95 for street improvements.

Richmond, Va.—Plans are being considered for paving N. 20th and N. 16th Sts. from Main to N. E Sts. Paving and widening of N. 3rd St. is also being considered.

Winfield, W. Va.—Election will be held Sept. 9 to vote on issuance of Poca-

tello District road bonds amounting to \$48,000.

Centralia, Wash.—County commissioners will soon call for bids for building about one-half mile of pavement on road leading north from city.

Vancouver, Wash.—State Highway Commissioner James Allen will recommend to next Legislature an appropriation of \$320,000 from the Public Highway Fund for completion of Pacific Highway from Vancouver to Tacoma.

Milwaukee, Wis.—Sealed bids will be received until Sept. 14, 3 o'clock p. m., for bonds amounting to \$380,000.

BIDS RECEIVED AND CONTRACTS AWARDED.

(* Indicates contracts awarded.)

Center, Ala.—Bids received for road building in Chlooke county as follows: Newell Construction Co., Birmingham, Ala.

Berkeley, Cal.—Oakland Paving Co. for paving University Ave. from Grove St. west to Third St.

Los Angeles, Cal.—W. E. Baxter for cleaning paved streets with vacuum sweepers at 10½ cts. per 1,000 sq. yds. of street surfaces.

Sacramento, Cal.—Bids received by California Highway Commission for constructing state highway, South Barbara county, Division V, route 2, section D (steel bridge and timber trestle), as follows: Mercer-Fraser Co., Eureka, Cal., \$124,650; The Snare & Trist Co., New York City, \$131,969; George E. Preble, Santa Ana, Cal., \$133,218; W. M. Ledbetter & Co., Los Angeles, Cal., \$133,480; Mesmer & Rice, Los Angeles, Cal., \$134,000. Engineer's estimate, \$130,397.

Joliet, Ill.—R. F. Conway, for paving several streets at \$56,474.25. Other bids: White Paving Co., \$58,831.25; American Asphalt Co., \$58,529.75.

Lincoln, Ill.—Harvey K. Rhodes, for paving three streets, at \$17,596.41.

Marion, Ill.—Bids received for 27,337 sq. yds. concrete pavement, 7-in. earth foundation, 25,961 cu. yds. earth excavation as follows: Johnson & Flodin, 3402 N. Clark St., Chicago, Ill., paving 99 cts. per sq. yd., excavation 30 cts. per cu. yd.; Wm. Lough & Son, local, paving 99 cts. per sq. yd., excavation 30 cts. per cu. yd.

Springfield, Ill.—Henry Nelch & Son for paving Peoria road from Eleventh St. to Sangamon Ave., with brick, \$26,586.92.

Springfield, Ill.—Contracts awarded for state aid work by the State Highway Commission on Aug. 9 and Aug. 16 are as follows: *Public Service Const. Co., East Peoria, Ill., LaSalle County, Section E, brick road, at \$17,975.02; Section F, brick road, at \$21,647.89; Section G, waterbound macadam road, at \$17,302.87; Section H, concrete road, at \$16,322.82; *L. A. McKnight, Robinson, Ill., Crawford County, Section C, concrete road, at \$7,152.53; Section D, concrete road, at \$7,380.51; *Claude Taggart, Martinsville, Ill., Clark County, Section C, concrete road, at \$8,177.07; *J. A. Gasaway, East St. Louis, Ill., Montgomery County, Section D, earth road, at \$6,650; *Gund-Graham Co., Freeport, Ill., Lee County, Section B, gravel road, at \$7,919.92; *J. W. McConnell, Carthage, Ill., Hancock County, Section B, earth road, at \$3,691; *W. O. Kunkel, Carthage, Ill., Hancock County, Section D, earth road, at \$2,770; *Wallace M. Harlan, Greenville, Ill., Monroe County, Section B, concrete road, at \$2,153.62.

Annapolis, Ind.—Thomas McGuckian & Sons, local, for paving concrete or cement walk around the court house.

Denison, Ia.—Bids received for 22,000 sq. yds. 7-in. 1-2-3 concrete paving, 3,000 cu. yds. clay excavation, as follows: M. L. Flinn Paving Co., paving, \$1,425 per sq. yd.; excavation, 40 cts. per cu. yd.

Paducah, Ky.—Bids received for concrete sidewalks, driveways, gutters, granite curbing and cast-iron drain pipes as follows: Second to Ninth Sts., Montana to Washington Sts., (1) Youcey & Johnson, local, \$27,069; (2) Thompson, Graham Co., Nashville, Tenn., \$26,301.20; (3) McAdoo Construction Co., Union City, Tenn., \$26,639; (4) Prosser & Halliday, Cairo, Ill., \$25,599; (5) George Katterjohn, local, \$25,788. Sixth St. between Kentucky Ave. and Tennessee St., (1) \$8,584, (2) \$8,403.20, (3) \$8,469.90, (4) \$8,218.50, (5) \$8,436.50. Fourth St., Montana to Clay Sts., (1) \$4,604.35, (2) \$4,482.25, (3) \$4,544.05, (4) \$4,385.50, (5) \$4,517. North side Clay St. 17th to 19th Sts., (1) \$1,330.35, (2) \$1,276.80, (3) \$1,296.91, (4) \$1,251.75, (5) \$1,321. Wood block paving. First to Fourth Sts., (2) \$16,141, (4) \$16,471, (5) \$14,265.

Hempstead, L. I.—The Standard Bitulithic Co., for paving Rockaway road from the Merrick road to the L. I. R. R., with a 5-year guarantee, at \$1.80 per sq. yd.; *E. M. Underhill & Son, Glen Cove, for repairing Mill Neck road in Oyster Bay township, at \$1.30 per sq. yd.; Andrews Bros., for paving Union Ave. from Marion St. to East Rockaway road, at \$1.40 per sq. yd.

Charlotte, Mich.—Ernest Stevens, Brookfield, for constructing a mile of road in Walton township at \$2,680.

Pontiac, Mich.—Bid received for paving Wessen St. from Walnut St. to Branch St. and Branch St. from Wessen St. to a point 100 ft. south of the north rail on the M. A. L. R. R. as follows: *James H. Baker & Son, at \$7,041.72 for Hocking Valley wire-cut lug brick.

Duluth, Minn.—August A. Bodin & Son, for improvement of 30th Ave., at \$6,333.30; *Rogers & McLean, for improving Minnesota Ave. from 38th to 43d Sts., at \$10,292.20.

Laurel, Miss.—M. H. Thomason of D'Lo, Miss., for grading new road from Laurel to Mossville, on the Jasper County line, a distance of 9 miles, work to begin at once.

Hannibal, Mo.—Bids received for paving and curbing Union St. from Birch to O'Fallon St., as follows: Heuston-Bland Stone Co., paving \$1.24 per sq. yd., curbing 34 cts. per lin. ft.; George W. Camery, paving \$1.25 per sq. yd., curbing 35 cts. per lin. ft.; *Wilson & Yeoman, paving \$1.19½ per sq. yd., curbing 32 cts. per lin. ft. Bids received for paving and curbing Tenth St., from Broadway to Lyon St., as follows: Heuston-Bland Stone Co., paving \$1.25 per sq. yd., curbing 35 cts. per lin. ft.; Geo. W. Camery, paving \$1.24 per sq. yd., curbing 34 cts. per lin. ft.; *Wilson & Yeoman, paving \$1.19½ per sq. yd., curbing 32 cts. per lin. ft.

Kansas City, Mo.—Gidinsky Construction Co., for grading and macadamizing Kentucky Ave. from Sugar Creek to Independence Ave., at Mount Washington, at \$21,000.

Kansas City, Mo.—Paul Hartung, for paving 2,000 ft. of concrete road connecting Swone Park and Hickman Mills road with Hillcrest Country Club at \$11,169.45.

Liberty, Mo.—Bids received for 2,200 sq. yds. concrete pavement as follows: Edgar Main, local, paving \$1.38 per sq. yd., curbing 38 cts. per lin. ft.; J. T. Carr Construction Co., local, paving \$1.23 per sq. yd., curbing 34 cts. per lin. ft.; Morse Ave., from Kansas St. to Franklin St., J. T. Carr Construction Co., paving \$1.23 per sq. yd., curbing 36 cts. per lin. ft.; M. Agee, paving \$1.28 per sq. yd., curbing 34 cts. per lin. ft.; Morse Ave. from Franklin St. to Mississippi St., Edgar Main, paving \$1.28 per sq. yd., curbing 28 cts. per lin. ft.; J. T. Carr Construction Co., paving \$1.23 per sq. yd., curbing 36 cts. per lin. ft.; M. Agee, paving \$1.28½ per sq. yd., curbing 34 cts. per lin. ft.

Albany, N. Y.—Bids received by State Highway Commissioner Duffy for improving by state aid Carthage-Antwerp road, Part 4, 4.05 miles long, as follows: P. J. Kennedy, Utica, N. Y., \$59,819.50; Roeh & Griffin Co., Watertown, N. Y., \$61,195.05; Pathfinder Const. Co., Inc., Fulton, N. Y., \$61,290.30; Spellman-Oliver Co., Chateaugay, N. Y., \$61,878.30.

Albion, N. Y.—F. H. Rhody, local, for paving Main St., 1.32 miles, at \$89,975. Other bidders: Lewis H. Brotsch, Buffalo, \$91,000; Thomas Fitzgerald Co., Fredonia, \$92,573; John Johnson Construction Co., Buffalo, \$95,745; Hembt & Washington, Monticello, \$97,876.

Owego, N. Y.—Bids received on Waverly-Lockwood county highway as follows: Lane Const. Corp., \$68,043.75; F. P. Merkes, Long Pond, Pa., \$77,107.25.

Saranac Lake, N. Y.—Defiance Corporation, Ticonderoga, for oiling about 24 miles of road running from Hamilton-Essex county line to Minerva in Essex County, at \$2,780.80. Other bidders were: E. H. Brown, Hempstead, \$9,900.12; H. A. Murphree, Albany, \$9,263.00; Clarence E. Walker, Troy, \$10,950.80.

Schenectady, N. Y.—Schenectady Contracting Co., for paving Regent St., at \$5,852.60; *Union Paving Co., for paving Yale St., at \$3,414.90; *Henry Aldershof, for grading Warner St., at \$317.

Bellefontaine, O.—O'Briant & Gregg, Marysville, for construction of one-third of a mile of concrete paving on Belle-

fontaine-Richwood pike near West Mansfield, at \$5,994.98.

Middletown, O.—Arpp-Simpson Co., for paving Superior and Highland Aves., at \$3,374.64. Other bidders were: C. C. Johns, \$3,542; Bigler Bros., \$3,342. *Arpp-Simpson Co., for paving Calumet Ave., at \$5,472; also paving Crescent Blvd., at \$3,893. *Fred Kesting, for paving Woodlawn Ave., at \$1,555.

Springfield, O.—Bids have been opened by City Manager Ashburner for paving of Euclid Ave. from Fountain Ave. to Yellow Springs St.; paving Lowry Ave. between Main and High Sts., and paving Center St. between Main and High Sts. Euclid Ave. bids were: For Trinidad sheet asphalt, M. J. Hannon, \$2.15; *Krumholtz & Huonker, \$2.20; W. F. Payne, \$2.30; for Aztec or Texico sheet asphalt: Krumholtz & Huonker, \$2.10; M. J. Hannon, \$2.12; W. F. Payne, \$2.20; J. J. McHugh, and Cleveland Trinidad Co. also bid on this work. The Center St. paving is to be of wood block. The bidders were W. F. Payne, *M. J. Hannon, and J. J. McHugh. The Lowry Ave. paving is to be sheet asphalt, asphalt block or bitulithic. The bidders were W. F. Payne, M. J. Hannon, J. J. McHugh, and Cleveland Trinidad Co.

Toledo, O.—Warner-McKechnie Co. for reconstruction of Treadway road with concrete, at \$28,469.95. Road is 2½ miles long.

Youngstown, O.—Doolittle & Garland, of Kent, for brick road, 1.72 miles long, in Austintown township, at \$24,859.19. *The Smith Construction Co., local, for 2 miles of brick from Struthers to the state line, at \$34,478.61. The work will be started at once, being under the supervision of the state, which will share the cost with the county.

Allentown, Pa.—Barber Asphalt Paving Co., for paving streets as follows: 13th St. from Hamilton to Fairview, and Russell from Fulton to 16th, at \$1.94 per sq. yd. for 1½-in. asphalt wearing surface; 1-in. binder course and 4-in. concrete base. Gordon St., 3d to Jordan, and 5th St. from Hamilton to Linden and 5th from Hamilton to Walnut, at \$2.03 per sq. yd. for 2-in. asphalt wearing surface, 1-in. binder and 6-in. concrete base. *L. M. Kratz & Son for the resetting of curb and laying sidewalks and gutters along the Walnut and Fountain Sts. sides of Nos. 923-27 Walnut St.

Ambridge, Pa.—It has been decided to pave Bryden road and hold up the work on other streets. The Bryden road portion will cost about \$17,000 and was awarded to *R. V. Baldwin.

Pittston, Pa.—Herrick Construction Co., for paving and curbing of the Midvale section of the Pittston Rd., for \$44,780.51. The work will be done with Bessemer Hillside brick and Hasting paving block.

Lenoir City, Tenn.—Bids received for 11,000 sq. yds. concrete asphalt, 5-in. concrete base, 2,500 cu. yds. old macadam excavation as follows: Murray Construction Co., Knoxville, Tenn., paving, \$1.47 per sq. yd.; excavation, 50 cts. per cu. yd. West Construction Co., Chattanooga, Tenn., paving, \$1.58 per sq. yd.; excavation, 60 cts. per cu. yd.

Galveston, Tex.—W. A. Kelso for replacing vitrified brick pavement on the boulevard between 37th and 39th Sts., at 17 cts. per sq. yd.

Republic, Wash.—R. L. Picken, Tonasket, Wash., for completing Permanent Highway No. 1B at \$11,237.76.

Menominee, Wis.—Andrew Carlson, local, for paving Stephenson Ave. from Main St. to Catherine St., with concrete.

West Allis, Wis.—Bids received for paving concrete wearing surface, excavation cut 1,731 cu. yds., fill 1,010 cu. yds., as follows: *Kroening Construction Co., Milwaukee, paving, \$1.49 per sq. yd., excavation 48 cts. per cu. yd.; Dean Construction Co., Milwaukee, paving \$1.54 per sq. yd., excavation 63 cts. per cu. yd.; C. J. Moritz, local, paving \$1.49 per sq. yd., excavation 60 cts. per cu. yd.

SEWERAGE

Los Angeles, Cal.—Ordinances have been passed ordering construction of sewers in several streets.

Key West, Fla.—See "Water Supply."

Ashton, Ill.—J. M. Egan, Jr., Co. of

Aurora has been awarded contract for installing \$34,000 sewer system in this city.

Calro, Ill.—City Engineer Dewey is preparing plans for an 18-in. sewer which will be constructed on 20th St. from Cedar to Commercial Ave. Address president of the Board of Local Improvements.

Anderson, Ind.—City engineer is preparing plans and specifications for the construction of sewer system. Address Mayor J. H. Mellett.

Kokomo, Ind.—A petition for a 20-in. tile drain in the Henderson ditch in Howard township was filed in the commissioners' court today by J. Moore, through his attorneys, Jump & Marshall. The drain affects a large amount of property in Howard township.

Boone, Ia.—A sewage disposal plant is to be constructed.

Topeka, Kan.—Storm water sewers will be built on Lake St. between 1st St. and Seward Ave., to connect with storm water sewers serving Santa Fe shops. Santa Fe will furnish material and city the labor.

Topeka, Kan.—Ten internal improvement bonds will be sold by city to meet cost of construction of sewer in District No. 49, located north of Sixth Ave. between California Ave. and Swygart. Construction of sewer will cost \$529,20.

Kenmore, Ky.—Bonds amounting to \$16,475 are to be issued, divided as follows: Fire alarm system, \$10,000; sewer, \$3,500; water main, \$975.

Grand Rapids, Mich.—The construction of a sewage disposal plant has been delayed.

Lansing, Mich.—Sewer bonds amounting to \$5,900 are to be issued. Sewers and drains will be constructed in several streets.

Duluth, Minn.—A sanitary sewer has been ordered in Fifth St., from 21st to 22d Ave. west, and gas and water extensions in Victoria St. from 34th Ave. east of Livingston St.

Gilbert, Minn.—See "Streets & Roads."

Minneapolis, Minn.—See "Water Supply."

St. Louis, Mo.—It is estimated that the cost of extensions to Mill Creek sewer will be \$1,350,000.

Lewistown, Mont.—Bonds will be issued amounting to \$25,000, divided as follows: Trunk sewer line construction, \$8,000; public park site, \$12,000; auto fire truck, \$5,000.

Camden, N. J.—An ordinance has been passed authorizing the construction of sewers, culverts or drains in and along 27th St. from Berkeley to Stevens St.

New Brunswick, N. J.—City Commission has voted for a storm water sewer for open brook along Commercial Ave.

Summit, N. J.—A system of storm water drainage is to be constructed at a cost of not less than \$100,000.

Oneonta, N. Y.—Plans for sewage disposal plant are nearly finished and will soon be ready to present to State Board of Health. Contract will be let as soon after acceptance of plans as possible.

Havana, N. Y.—Geo. B. Gibbons & Co., New York, have purchased sewer bonds amounting to \$14,000.

La Grange, N. C.—See Streets and Roads.

Centerburg, O.—See "Streets & Roads."

Massillon, O.—A sanitary sewer is to be constructed in Fay St. between Walnut and Beckman Sts.

Middletown, O.—Estimate of cost of construction of new sewers in city was given by Berry Bros. as \$1,193.61.

Mt. Vernon, O.—An ordinance has been passed providing for construction of a sanitary sewer in Mulberry St. from Chestnut St. to Ohio Ave.

Miles, O.—City Engineer Howard W. Turner is going over plans for disposal plant with engineers from five other cities, to be known as the "six city disposal plant."

Springfield, O.—Jas. Doyle is low bidder on construction of Sycamore St. sewer.

Toledo, O.—Sealed proposals will be received until 11:30 a. m., Sept. 5, for main sanitary sewer bonds amounting to \$41,000.

Sand Springs, Okla.—An election is proposed to vote on the issuance of \$30,000 sewer bonds.

Harrisburg, Pa.—Ordinances providing for sewers and Bellevue road; Agate St. in sections of Brookwood St. and Bellevue road; Agate St. from Geary to a point 180 ft. west; in an 18-ft. section of a 9-ft. alley, paralleling Agate on the

south and in an 18-ft. section of an adjacent 15-ft. alley have been introduced by Commissioner Lynch.

Lansdale, Pa.—State authorities have ordered a sewage system constructed, estimated cost \$225,000 to \$250,000.

Fort Worth, Tex.—Election will soon be held to vote on issuing bonds in excess of \$800,000. Of this amount \$363,000 will be for sewage disposal plant, and \$300,000 for street improvements.

Fort Worth, Tex.—A proposition is under consideration for the city and the packing houses on the North Side to unite in building a large sewage plant if the demonstration just completed by Mulloy proves satisfactory.

Sweetwater, Tex.—J. McA. Stephenson, an attorney of this place, has purchased \$50,000 bond issued for extension of sewer system and installation of sanitary disposal plant. Work will be begun at once.

Sturgeon Bay, Wis.—See "Water Supply."

BIDS RECEIVED AND CONTRACTS AWARDED.

(* Indicates contracts awarded.)

Berkeley, Cal.—W. T. Tobin for construction snailuck Ave. sewer; also Hopkins St. sewer.

Torrington, Conn.—John E. Driscoll, for construction of sanitary sewers, at \$9,130.20. Other bidders were: Frank Fabri, Litchfield, \$9,078.50; Benjamin Ussola & Co., \$9,120.51; John Demichiel & Bros. Co., \$9,130.55.

Springfield, Ill.—Henry Nelch & Son, for constructing sewer in Peoria road from Kiugly Ave. to Sangamon Ave., at \$4,005.00.

Logansport, Ind.—Plainer, Moore & Co., for constructing Douglass St. sewer.

Paducah, Ky.—See "Streets & Roads."

Chillicothe, Mo.—J. Bernard Klein for constructing sewer on Ninth St. from Eastin to Broadway, at \$504.19.

Brooklyn, N. Y.—Sewers to be constructed, with the lowest bidder and his price, follow: For the construction of a sewer and appurtenances in Luring St. from 1st St. to Way Ave.; Way Ave., from Luring St. to Aislyne Ave.; Aislyne Ave., from Way Ave. to Junction Ave., and in Junction Ave. from Aislyne Ave. to Hunt St., Clancy & Van Aist, \$150,933.60. For the construction of a sewer and appurtenances in Collins Ave., from Mount Olivet Ave. to Adriatic St.; Adriatic St., from Collins Ave. to Fresh Pond road, and in Fresh Pond road, from Mount Olivet Ave. to Woodbine St., Joseph Di Cola and John S. Martino, \$108,633.97. For the construction of a sewer and appurtenances in Forbes St., from California Ave. to Jackson Ave.; Jackson Ave., from Forbes St. to Clarence St.; Dunsing St., from Jackson Ave. to the crown, about 356 ft. south of Mitchell Ave.; Clarence St., from State St. to the crown, about 315 ft. south of Mitchell Ave., Kenmore Contracting Co., Inc., \$32,025.79. For the construction of a sewer and appurtenances in Woodbine St., from Fresh Pond road to Prospect Ave., and in Prospect Ave., from Woodbine St. to Madison St., The Green Contracting Co., \$5,135. For the construction of a sewer and appurtenances in Joslin (22d) St., from Larch Ave. to Queens Ave., The Green Contracting Co., \$2,015.10. For the construction of a sewer and appurtenances in 19th St., from Cypress Ave. to Franconia Ave., Thomas F. Touhy & Co., \$1,717.64. For the construction of a sewer and appurtenances in Center St., from Wyckoff Ave. to a point about 400 ft. northerly from Wyckoff Ave., John C. Schrade, \$1,170.75.

Schenectady, N. Y.—Beckwith Bros., for catchbasins and extras in various streets, storm water outlet in Pleasant St. and repairs to sub-trunk sewers along river front, at \$3,777.60. *Sewage Disposal & Water Plant Co., for storm water outlets in Third Ave., Congress St. and Osterlitz Ave. and for sanitary sewers in Sixth and Seventh Aves. and Maxwells and Rosa roads, at \$2,893.80. *Henry Aldershof, for sewers in Wright and DeCamp Aves. and for surface water sewers in Regent St., at \$2,472.10.

Sandusky, O.—M. J. Callan for sewer work on Jefferson St., at \$178, and Madison St., at \$175. *H. W. Homberger for laying sewer in Market St. from Wayne St. to Hancock St., at \$625.

Erie, Pa.—*Willis Bancroft, Jr., for constructing storm water sewers in Marvin Ave. from Pine Ave. to a point 40 feet north of south city line, at \$1,269. Engineer's estimate, \$1,964.

Nashville, Tenn.—*P. H. Thrasher, for construction of Middle Creek Canal near Chester-McNairy county line. The contractor will remove 228,000 cu. yds. of earth. Contract price is \$21,000 for excavation and \$12 per acre for the clearing of right of way.

WATER SUPPLY

Argenta, Ark.—The water works improvement district No. 2 has been organized to acquire the Arkansas Water Co.'s plant. About \$200,000 will be expended for extensions and improvements.

Nashville, Ark.—Winters & Dove, engineers, Merchants' Bank Bldg., Fort Smith, Ark., are preparing estimates for the construction of water works system.

Newport, Ark.—The Arkansas Light & Power Co. has applied for franchise to construct water works system.

Coalinga, Cal.—Engineer is to be employed to plan a new municipal water system; the Pleasant Valley plant may be purchased if the price is considered reasonable.

Grass Valley, Cal.—A plan has been suggested to mortgage the municipal water system for the purpose of installing a nitration plant and an auxiliary system to feed the mains, improvements to cost about \$80,000.

Aurora, Colo.—A special election is to be held to decide whether to issue \$250,000 refunding bonds to take the place of water bonds of same amount.

Washington, D. C.—(Bureau of Foreign and Domestic Commerce, Department of Commerce).—The proprietors of an aerated water plant in the Far East are interested in a pressure sand filter to pass 30,000 gallons of water in 24 hours at a pressure of 10 pounds per square inch. (Refer to "Opportunity Number" 22204.)

Washington, D. C.—Maryland state and county representatives have conferred with board of commissioners regarding extending the water system.

Key West, Fla.—City clerk wishes to receive correspondence on a water or sewerage franchise proposition.

Galesburg, Ill.—City council has passed ordinances for extension of water mains on Jefferson, North Cherry, South Pearl and West First Sts.

Joliet, Ill.—See Streets and Roads.

Joliet, Ill.—Election will be held Sept. 15 to vote on issuance of bonds amounting to \$25,000 for water works improvement.

Utica, Ill.—The contract for the construction of a concrete receiving reservoir to be a part of the village water system was awarded to John O. Hyatt, of Utica. The main contract for Utica's water system is to be let within 60 days.

Middlebury, Ind.—Plans are being discussed for construction of municipal waterworks system. Address Village Clerk.

Ossian, Ia.—Work will soon start on the water works system.

Concordia, Kan.—The city of Concordia filed an application with the Kansas public utilities commission asking approval of plans and specifications for \$12,870 worth of improvements and extensions for the city water works. Address City Clerk.

Powhattan, Kan.—An election will be held soon to vote on the erection of a municipal water works.

Louisville, Ky.—Within the next ten days President W. O. Head, of the board of water works, expects to be ready to advertise for bids on the new \$600,000 river pumping station and an additional 30,000,000 gallon pump. Bids for this improvement will probably be opened by the middle of September.

Constantine, Mich.—The council will call an election to vote on the question of issuing \$11,000 water works bonds. Address city clerk.

Detroit, Mich.—Bids received for reservoir at Highland Park have been rejected as excessive and village may build its own reservoir.

Lansing, Mich.—Plans are being prepared for two circular 3½ million gallon

reservoirs. Address General Manager Crane.

Menominee, Mich.—New pumps to be installed at water works will be run by electricity instead of steam power.

Pontiac, Mich.—Howard H. Barnett, civil engineer, suggests a bond issue for parks and additional water works.

Minneapolis, Minn.—Resolutions have been passed providing for water mains, sewers, artificial curbs and gutter, artificial stone sidewalks and street sprinkling of several streets.

Rochester, Minn.—The proposed improvements at water system include building additions; 1,000,000 gallon reinforced concrete reservoir; one addition artesian well, two electrically operated centrifugal pumps, air lifts for artesian wells, air compressors, piping connections, etc. Address City Clerk.

Galena, Mo.—The filtration plant contract will soon be let.

Kenmore, N. Y.—(See "Sewerage.")

Lockport, N. Y.—Water Board has been directed to replace 4-in. water pipe in Prospect St. between Ontario and Niagara Sts. with 6-in. pipe to connect with Park Ave. main.

La Grange, N. C.—See Streets and Roads.

Bridgeport, O.—West End bridge bonds amounting to \$10,000, and water main bonds \$10,000, are to be issued.

Cincinnati, O.—Ordinance has been passed providing for issuance of bonds amounting to \$400,000 for extending, enlarging and improving water works.

Cleveland, O.—Sealed bids will be received until Sept. 25, noon, for the purchase of water works bonds amounting to \$460,000.

Cleveland, O.—An immense water conservation plan, touching Cuyahoga, Summit, Portage and Geauga counties, has been prepared by State Superintendent of Public Works Frank Fauver at Columbus, and will be recommended to Governor F. B. Willis and the next legislature in Supt. Fauver's annual report. The plan contemplates an immense artificial lake lying at the intersection of the four counties, covering about 7 sq. miles, with water from 2 to 50 ft. deep.

Middletown, O.—Engineer G. S. Polard estimates a new addition to water works building for housing of pumping engine at approximately \$14,350.

Zanesville, O.—Engineer J. Richard Kommer of the Federal Engineering Co., of Pittsburgh, hopes to have the revised plans for the new well water system ready to submit to the city council by Sept. 1. These will be completed in a way to enable contractors to bid on the plant as a whole or in parts.

Morris, Okla.—Bonds amounting to \$10,000 will be issued for water works.

Woodward, Okla.—Bonds amounting to \$12,500 for water works are to be issued; also \$2,500 for electrical improvement.

Junction City, Ore.—Issuance of water plant bonds amounting to \$10,000 has been indefinitely postponed.

Silverton, Ore.—An election will be held soon to vote on the question of issuing bonds amounting to \$21,000 for the water system.

Johnstown, Pa.—Permission has been granted the Johnstown Water Co. to install a 6-in. main at Seventh Ave. and Bradley alley, to replace the smaller pipe that now serves this district.

Philadelphia, Pa.—City is considering the installation of a new water plant costing \$5,000,000.

Tipton, Pa.—Election will be held Nov. 7 to vote on question of issuing bonds amounting to \$9,000 for electric lights and \$7,000 for water supply.

Camden, S. C.—Sept. 12 a special election will be held to vote on the issuance of bonds amounting to \$25,000, \$18,000 of which is for water works and \$7,000 for electric light.

Bristol, Tenn.—A hydro-electric plant to cost \$75,000 is planned, including a dam across the Holston River, one mile below big creek. The power thus generated is to be used to operate the street railways cars of Bristol and an interurban line from Bristol to Kingsport is contemplated. The dam will be of concrete construction and will be 14 ft. high in the center. Ben L. and Fred Dulaney have acquired the water rights and expects to erect a plant capable of generating fully 1,000 horse power.

Austin, Tex.—Bonds amounting to

\$100,000 for water works will be issued.

Austin, Tex.—Bonds have been approved as follows by Attorney General's Dept.: Loraine permanent water works bonds, \$5,000; Bell County road improvement, District 14, \$3,000.

Maypearl, Tex.—An election will be held Sept. 9 to vote on \$7,000 bonds for water system. Address Mayor.

Palestine, Tex.—The Palestine Water Works Co. will improve water system. Filtration plant will be installed.

Temple, Tex.—The City Water Commission plans to construct concrete reservoir with capacity of 6,000,000 gallons of water. Address Mayor.

Antigo, Wis.—Approximately 4,500 feet of water mains will be laid on the site of the Langlade Lumber Co.'s new sawmill, comprising an elaborate system of fire protection.

Sturgeon Bay, Wis.—The finance committee has been directed to advertise for bids for the construction of water works and sewer system for which \$35,000 in bonds have been issued. Address City Clerk Langemak.

Moncague, Salvador.—The town of Moncagua is to be supplied with water by hydraulic power carrying 21,000 gallons in 24 hours a distance of 3,900 feet and to a height of 160 feet. Other towns installing water systems are San Miguel, Ahuachapan, Usulután, Sonsonate, and San Juan Nonuelco. Electric lighting is being installed in Coatepeque and San Vicente, and acetylene lighting in Metapan and Chalatenango.

BIDS RECEIVED AND CONTRACTS AWARDED.

(* Indicates contracts awarded.)

Twin Falls, Idaho.—S. E. Burnham, Boise, for work on Miller Dam, at approximately \$25,000.

Waukon, Ia.—C. D. Nolan, Cedar Rapids, Ia., for drilling well at iron mines.

Duluth, Minn.—J. R. Griffith, on a bid of \$10,000 to explore for and produce a new well water supply at New Duluth, by the city council yesterday afternoon. Griffith offers, in his bid, to dig to a depth of 375 feet and supply the city with 575,000 gallons of water a day.

Duluth, Minn.—A. Hedenburg, for constructing 6-inch water and 4-inch gas mains in Superior St., from 46th to 48th St. West, at \$751. *Norquist & Berg, for constructing 6-inch water and 4-inch gas mains in the boulevard from existing mains in Chester parkway, to 483 ft. west of Chester parkway, at \$475; also for construction water and gas mains in Juniata St., at \$2,980; and in Fifth St., at \$1,664.

Gary, Minn.—Bids received for new well at Commonwealth Ave., at Northern Pacific right of way, as follows: A. P. Lacey, \$9,000 for 150,000 gallons per 24 hours; J. R. Griffith, \$10,000 for 400,000 gallons per 24 hours; Layne-Bowler Co., of Memphis, Tenn., \$43,500 for 500,000 gallons per 24 hours.

New Brunswick, N. J.—Estimates have been received for motor-driven centrifugal pumping units for water department, submitted by New York Continental Jewell Filtration Co. of New York City. Three pumps are to be installed, one of 3,000,000 gals. capacity and two of 6,000,000 gals. capacity. For pumps of the Kingsford Foundry & Machine Works the estimate was \$8,552 and the alternate bid, for Worthington pumps, was \$8,627.

Syracuse, N. Y.—Bids received for trench digging machine. Specifications were prepared for a type of machine desired especially for the bureau in laying water mains. The Buckeye Traction & Ditching Co. submitted the only bid, \$4,400.

Erie, Pa.—*Dravo-Doyle Co., Pittsburgh, for construction of a 20,000,000-gallon pump for the water works station at \$51,500.

MISCELLANEOUS.

Lodi, Cal.—All bids for municipal bathing house have been rejected as excessive of Engineer's estimate; alterations will be made in plans.

Oroville, Cal.—Upon recommendation of District Attorney Leonard, Supervisors have passed resolution calling for bids for county auto service in Chico, Oroville and Gridley. Bids are to be based on certain rate per mile and standing time.

Stockton, Cal.—Plans and specifications for furnishing 24 iron gates and installing them on the south side of the

shed occupied by the California Navigation and Improvement Co. on the waterfront have been introduced. The cost of furnishing and constructing the gates is estimated at \$1,200.

Terra Bello, Cal.—Bonds to the amount of \$1,000,000 to supply an irrigation system for 12,000 acres of the finest circus lands in the thermal belt have carried. Bids will be advertised for at once.

Washington, D. C.—(Bureau of Foreign and Domestic Commerce, Department of Commerce.) A Norwegian import firm desires to be placed in communication with American manufacturers of automobile tires and accessories. Correspondence in English. (Refer to Opportunity No. 22,195.)

Washington, D. C.—(Proposals for Government Supplies and Construction.) Sealed proposals will be received at the Bureau of Supplies and Accounts, Navy Department, Washington, D. C., for the supply of the following: Schedule 26, jack plugs for telephone, scoop shovels, composite pipe fittings, steel boiler tubes, low pressure brass angle and gate valves. (Refer to Opportunity No. 3516.)

Idaho Falls, Ida.—At the November election Bonneville county taxpayers will be asked to vote \$100,000 for a new courthouse and \$25,000 for three new bridges—one of them very badly needed over the south fork of the river.

Ontario, Ida.—A bond issue of \$750,000 has been authorized for the building and completion of the Warm Spring irrigation project which will reclaim 35,000 acres of land.

Lansing, Mich.—At the regular election in November voters will vote on plans for garbage collection and disposal system.

Pontiac, Mich.—(See Water Supply.)
Saginaw, Mich.—The Mayor is urging a new police building. He also asks the city council to carefully consider the problem of garbage disposal.

Lewistown, Mont.—See "Sewerage."

Longport, N. J.—Case Coast Const. Co., New York, has prepared plans for construction of a concrete sea wall, approximate cost of which is \$275,000.

Morristown, N. J.—(See Streets and Roads.)

Utica, N. Y.—Cummings, Prudden & Co., New York, have purchased city bonds amounting to \$27,000, for improvement in Thomas R. Proctor Park, and resurfacing streets.

Cleveland, O.—City is to purchase an 8-ton auto truck to be used for collection of waste paper and garbage, if satisfactory, about fifty will be purchased.

Hamilton, O.—City council are considering submitting the question of issuing \$200,000 in bonds for a city building on the present site, \$300,000 in bonds for the purchase of a new site and erection of the new city building, \$60,000 in bonds to motorize the fire department and \$10,000 in bonds to extend cluster lighting in the city to the voters of this city at the election in November.

Marion, O.—An ordinance has been passed providing for issuance of bonds amounting to \$3,200, for sanitary purposes.

Wooster, O.—City council is considering the application for a franchise for a garbage disposal plant.

Carriek, Pa.—Sealed proposals will be received until Sept. 7, 8 o'clock p. m., for bonds amounting to \$125,000. Edgar W. Meyers, Secy. of Council.

Erie, Pa.—The engineering department is now at work on plans and the preparation of data for the construction of the retaining walls of the subway and the paving of the street. The latter improvement will extend from 14th to 18th Sts. The paving will be of asphalt, 64 ft. wide with the sidewalks. There will be a 14-ft. clearance under the tracks. An ordinance authorizing this work and calling for bids will be prepared as soon as the data is ready.

Dallas, Tex.—Plans have been prepared by Lang & Witchel for a county farm home.

Dallas, Tex.—Two comfort stations are to be built; preliminary estimates are \$2,000 each.

Waco, Tex.—City Commissioners will install a police signal system to replace old one, at a cost of \$3,708.60.

Milwaukee, Wis.—The installation of another garbage incinerator is under consideration.

Spokane, Wash.—Bond issue amounting to \$180,000 will be offered for sale Oct. 1.

BIDS RECEIVED AND CONTRACTS AWARDED.

(* Indicates contracts awarded.)

Woodland, Cal.—Supervisors have opened bids for construction of Yolo County's \$200,000 Court House. Robert Trost, San Francisco, \$193,167, and H. S. Williams, San Francisco, \$197,716, were lowest bidders. Other bidders were: Masow & Morrison, \$205,677; James L. McLaughlin, \$198,000; C. J. Guth, \$200,000; Anderson & Ringrose, \$211,470; H. J. Klyce, \$216,442; Mathews Const. Co., \$211,659; McLaren & Peterson, \$198,000; Larsen-Samson Co., \$200,000.

Morristown, N. J.—(See Streets and Roads.)

Newark, O.—T. W. Cissell, Wooster, for constructing new post office building, at \$103,400 for limestone and \$110,000 for sandstone.

Allentown, Pa.—W. H. Gangewere & Co., Inc., for restoration Trout Hall, at

\$3,480, with additional \$100 for a quarry tile floor on front and side porches, and \$260 additional for reinforced concrete porch and tile finish at rear of building. Total \$3,840.

Erie, Pa.—F. C. Diefendorf, for work on Mill Creek, at \$8,942.50.

Pittston, Pa.—Good Roads Co., for 175 signs and 175 sign posts.

Galveston, Tex.—Sam Fridner, for supplying approximately 2,500 tons of riprap for the sea wall, at \$3.50 per ton.

TOO LATE FOR CLASSIFICATION

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS.				
Pa.	Bradford	5 p.m., Sept.	4.. 3,516 sq. yds. brick pavement.	B. A. Wise, City Engineer.
Mo.	Webb City	5 p.m., Sept.	4.. Grading and improving streets.	L. E. Briggs, City Engineer.
Pa.	Arnold	8 p.m., Sept.	4.. 5,400 sq. yds. brick paving; 9,200 ft. concrete curb and gutter, and 22,000 cu. yds. grading.	B. S. Dinsmore, Boro Engineer, New Kensington, Pa.
R. I.	Providence	2.15 p.m., Sept.	5.. Grading roadbed and building 2½ miles railroad tracks to municipal wharf.	City Engineer.
Pa.	Pittston	8 p.m., Sept.	5.. Paving with vitrified brick.	E. H. Coward, Engineer, Miners' Bank Bldg.
N. J.	Bloomfield	8 p.m., Sept.	5.. 5,000 tons broken stone.	R. F. Davis, Town Clerk.
N. J.	Hillside	8.15 p.m., Sept.	6.. Concrete walks, curb and crosswalks.	W. H. Luster, Engineer, 286 N. Broad St., Elizabeth, N. J.
N. J.	Cranford	8.30 p.m., Sept.	6.. 1,500 sq. yds. macadam; 2,200 lin. ft. concrete sidewalk, and 680 ft. concrete curb and gutter.	Edw. Mosher, Twp. Engineer.
Me.	Augusta	11 a.m., Sept.	6.. Grading and graveling state roads.	P. D. Sargent, Chief Engr., State Highway Comm.
Ill.	Springfield	11 a.m., Sept.	6.. Constructing state highways.	W. W. Marr, Chief State Highway Engineer.
Tex.	El Paso	Sept.	7.. Paving two streets.	City Engineer.
O.	Sandusky	noon, Sept.	8.. Brick, asphalt or concrete paving.	K. B. Ward, City Manager.
N. Y.	New York	10.30 a.m., Sept.	11.. 47,000 sq. ft. concrete walk; grading; 7,500 ft. of curb, etc.	Douglas Mathewson, Boro Pres.
Tex.	Georgetown	2 p.m., Sept.	11.. 12 miles gravel road.	W. W. Jenkins, County Aud.
N. Y.	Brooklyn	11 a.m., Sept.	12.. Asphalt or asphalt block pavement, sidewalks and curbs.	Bureau of Hwys., 50 Court St.
Pa.	Prospect Park	8 p.m., Sept.	12.. 9,000 sq. yds. pavement.	A. F. Damon, Jr., Engineer, Darby, Pa.
N. J.	New Brunswick	Sept.	12.. Brick, asphalt block or Warrenite on ten streets.	City Engineer.
N. J.	Carlstadt	8 p.m., Sept.	14.. 2,895 ft. concrete curb and gutter.	Ernest Walmach, Boro Clerk.
Ind.	South Bend	11 a.m., Sept.	18.. Paving bridge; 5-ton motor truck; one oil road sprinkler.	A. F. Wolf, County Auditor.
SEWERAGE.				
Pa.	Bradford	5 p.m., Sept.	4.. 2,500 ft. 4 to 18-in. tile sewers and manholes.	B. A. Wise, City Engineer.
Mo.	Webb City	5 p.m., Sept.	4.. Constructing sanitary sewer.	L. E. Briggs, City Engineer.
Tex.	Marlin	2 p.m., Sept.	6.. Sanitary sewers and disposal plant.	Levi Goodrich, City Engineer.
Neb.	Omaha	Sept.	6.. 2,200 ft. 8 to 15-in. sewers.	J. A. Bruce, City Engineer.
WATER SUPPLY.				
Mo.	St. Louis	Sept.	1.. 1,800 tons 6 to 36-in. c. i. pipe.	Dept. Public Utilities.
Pa.	Harrisburg	3 p.m., Sept.	7.. Laying water mains in several streets.	H. F. Bowman, Supt. Public Safety.
Ill.	Chicago	Sept.	8.. Valves and parts at pumping station.	W. R. Moorhouse, Comr. of Pub. Works.
O.	Sandusky	noon, Sept.	8.. Laying water mains in several streets.	K. B. Ward, City Manager.
Ind.	Fort Wayne	10 a.m., Sept.	12.. Water supply for County Farm.	Will Johnson, County Aud.
O.	Mansfield	Sept.	12.. 2,258 ½-in. to 6-in. water meters.	Ora Hursh, Dir. Pub. Service.
MISCELLANEOUS.				
R. I.	Providence	2.15 p.m., Sept.	11.. 200,000 hard body bricks.	Comr. of Public Works.
Fla.	Jacksonville	noon, Sept.	11.. 500 to 15,000 tons rip-rap stone.	J. C. O'Dell, Gen. Mgr.
Ind.	Hartford City	noon, Sept.	12.. Cleaning and repairing 11 ditches.	Orville Schmidt, Trustee, Washington Township.

STREETS AND ROADS

Tucson, Ariz.—There is a resolution declaring intention to improve certain portions of Main St., Meyers St., Court St., Church St., Congress St., Pennington St., Ott St., and Alameda St.

Oroville, Cal.—Supervisor C. E. Porter will present a resolution at next meeting of board providing for appropriation of \$5,000, to be used in repairing Oroville-Quincy road, near Miller's ranch.

Boise City, Ida.—Municipal paving bonds amounting to \$29,285.91 are to be issued.

Channahon, Ill.—At a special election held lately it was voted to levy an assessment for gravel or macadam roads.

Peotone, Ill.—Voters have decided in favor of a special tax for gravel, rock macadam or other hard roads.

Hartford City, Ind.—Sealed proposals will be received until noon, Sept. 4, for the purchase of road bonds amounting to \$3,000. George H. Newbauer, treasurer, Blackford County.

Indianapolis, Ind.—Edward O'Gara has purchased Benton county highway bonds amounting to \$11,400.

Indianapolis, Ind.—Commercial Bank of Crown Point has purchased road bonds amounting to \$38,000.

Chillicothe, Mo.—A resolution has been passed to grade, curb, pave and other-

wise improve Walnut St. from Third St. to Ann St.

Newark, N. J.—Mapes Ave. from Bergen St. to Osborne terrace is to be paved with asphalt. Vroom alley is to be repaved.

New Brunswick, N. J.—An ordinance has been passed providing grading, paving and curbing of ten streets.

Passaic, N. J.—Freeholders have rejected bids on a part of Greenwood Lake road as excessive. A petition has been received from the board of education for the construction of an asphalt-bound macadam pavement on Bergen St.

Schenectady, N. Y.—Sealed bids will be received until 12 noon, Sept. 14, for the purchase of highway bonds amounting to \$100,000. W. E. Walker, county treasurer.

Syracuse, N. Y.—Sealed bids will be received for the purchase of paving bonds amounting to \$7,000 until 8 o'clock p. m., Sept. 5, by Leonard B. Smith, clerk of the village of Eastwood, N. Y.

Bowling Green, O.—Notice has been given of improvements to the following named roads: W. W. Billman stone road; William Westerfield stone road; R. H. Wollam stone road; C. T. Pollard stone road; David Shanks stone road; Charles H. Lemmerbrock stone road.

Cleveland, O.—E. H. Rollins & Sons have purchased street improvement bonds amounting to \$342,000.

Springfield, O.—Sealed proposals will be received until noon, Sept. 25, for the purchase of paving bonds amounting to \$2,300. W. J. Barrett, city auditor.

Erie, Pa.—When annual appropriations are made up street department will ask for \$5,000 with which to purchase motor-driven street flusher.

Wilkes-Barre, Pa.—Ordinances have been passed providing grading, curbing and paving of Meade St., between Market and Coal Sts., with sheet asphalt; Willow St., between Carey Ave. and Plymouth Ave., Simpson St., between Carey Ave. and Plymouth Ave., and Oak St., between Carey Ave. and Plymouth Ave., with sheet asphalt; Franklin St., between Kulp Ave. and Elms St., with sheet asphalt.

Richmond, Va.—City engineer has been instructed to advertise for bids for grading and cinderling McDonough St. from 24th to factory of Virginia Leather Co.; also requested to prepare a profile and make a survey showing proper grades for all alleys in block bounded by Main St., Floyd Ave. Blvd. and Deep Run St.

Centralia, Wash.—City commission has passed resolution ordering the paving of Chehalis Ave.

Charleston, W. Va.—Petitions are being circulated in an effort to have brick pavement in Capitol and Lee Sts. resurfaced with asphaltic concrete.

BIDS RECEIVED AND CONTRACTS
AWARDED.

(*Indicates Contracts Awarded.)

Marysville, Cal.—The Federal Construction Co., San Francisco, for grading and paving in sections 1, 2 and 3. Section 1 at .096 cts. per sq. ft.; section 2, .1111 cts. per sq. ft., and section 3, .1129 cts. per sq. ft.

Flacerville, Cal.—A. Teichert & Son, Sacramento, for paving Main St., at \$21,-070.80.

San Jose, Cal.—Bids received for improvement of Lawrence Station road, in Supervisor District No. 4, as follows:

Surveyor's estimate, \$12,900; John W. McDonald, \$12,740; *Charles W. Hamilton, \$10,240; John F. Adams, \$11,250; Western Motor Draying Co., \$10,360; A. Klatt, \$11,990. Lincoln Ave., in Supervisor District No. 4, as follows: Surveyor's estimate, section 1, \$5,640; section 2, \$13,660; John Doyle, section 1 \$6,943, section 2 \$13,199; City Street Improvement Co., section 1 \$6,307, section 2 \$14,923; John W. McDonald, section 1 \$5,600, section 2 \$13,110; *Ralsch Improvement Co., section 1 \$5,150, section 2 \$13,200; Paul & Caldwell, \$18,208. Campbell Ave., in Supervisor District No. 4, as follows: Surveyor's estimate, \$6,725; City Street Im-

provement Co., \$7,466; John F. Adams, \$6,666; John W. McDonald, \$7,190; *Ralsch Improvement Co., \$6,250; Paul & Caldwell, \$8,084.45; John Doyle, \$7,261. San Martin Ave., in Supervisor District No. 1, as follows: Surveyor's estimate, \$3,060; John W. Williams, \$3,000; Wilson & Christiansen, \$3,387; *A. Peart, \$2,650; John F. Adams, \$2,925; John W. McDonald, \$3,000; John W. Doyle, \$2,982.

Chicago Heights, Ill.—John Mackler, for constructing 4½ miles of concrete road on the Lincoln highway.

Fort Wayne, Ind.—See "Sewerage." **Joliet, Ill.**—R. F. Conway Co., for improvements of Fifth Ave. and other

GLENDDIVE, MONTANA.

Bids received August 17th on water works improvements.
Burns & McDonnell, Engineers, Kansas City, Mo.

FILTER CONTRACT.

Name of Bidder.....	S. Birch & Sons C. Co. Great Falls, Mont.	*Norwood Eng. Co. Florence, Mass.	Pittsburgh Filter Co. Pittsburgh, Pa.
Address of Bidder.....			
Lump sum bid.....	\$35,900.00	\$32,610.00	\$34,220.00
Operating table deduction.....	1,155.00	1,140.00	1,200.00
For not removing old building deduct.....	225.00	280.00	275.00
Specification	Quantity	Per	Amount
Earth excavation, cubic yards.....	1,025	.50	.60
Concrete, cubic yards.....	445	10.60	13.50
Reinforcing steel, pounds.....	22,500	.05%	.06½%
Structural steel, pounds.....	1,530	.07	.08
8-inch cast iron pipe, class "B," lineal feet.....	14	2.65	2.85
10-inch cast iron pipe, class "B," lineal feet.....	25	3.75	3.80
16-inch cast iron pipe, class "A," lineal feet.....	130	4.70	4.70
12-inch vitrified sewer pipe.....	72	1.15	1.50

PIPE LAYING CONTRACT.

Name of Bidder.....	Hector Coolsaet, Marshall, Minn.	Oliver & Brumbeck, Glendive, Mont.
Address.....		
Specification	Quantity.	Per
4-inch cast iron pipe, haul and lay, 12-foot lengths.....	700	.72
4-inch cast iron pipe, haul and lay, 16-foot lengths.....	700	.70
6-inch cast iron pipe, haul and lay, 12-foot lengths.....	24	.80
8-inch cast iron pipe, haul and lay, 12-foot lengths.....	2,960	.90
8-inch cast iron pipe, haul and lay, 16-foot lengths.....	2,960	.88
10-inch cast iron pipe, haul and lay, 12-foot lengths.....	2,360	1.00
Fire hydrants, haul and lay.....	3	5.00
4-inch gate valves and boxes, haul and set.....	3	2.50
6-inch gate valves and boxes, haul and set.....	6	3.00
8-inch gate valves and boxes, haul and set.....	11	4.00
10-inch gate valves and boxes, haul and set.....	4	5.00
Total of bid on 12-foot lengths.....		\$5,651.70
Total of bid on 16-foot lengths.....		\$5,531.30

HYDRANTS AND VALVES.

Name of Bidder.....	Am. C. I. Pipe Co., Minneapolis, Minn.	Kennedy V. Mfg. Co., Elmira, N. Y.	*Merkle-Hines M. Co., Kansas City, Mo.
Address of Bidder.....			
Lump sum bid.....	\$797.10	\$642.90	\$659.25
Specification	Quantity	Per	Amount
Fire hydrants, 4-inch connections.....	1	40.50	40.50
Fire hydrants, 6-inch connections.....	2	44.00	88.00
4-inch gate valves.....	3	8.35	25.05
6-inch gate valves.....	6	14.15	84.90
8-inch gate valves.....	11	23.55	259.05
10-inch gate valves.....	4	38.90	155.60
Two-piece valve boxes, 6½-foot trench.....	24	6.00	144.00

CAST IRON PIPE.

Name of Bidder.....	*Amer. C. I. Pipe Co., Minneapolis, Minn.	U. S. C. I. P. & F. Co., Minneapolis, Minn.
Address of Bidder.....		
Specification	Quantity.	Per
4-inch cast iron pipe, 12-foot lengths.....	7.5 tons	\$44.35
4-inch cast iron pipe, 16-foot lengths.....	7.5 tons	45.35
8-inch cast iron pipe, 12-foot lengths.....	70.3 tons	41.35
8-inch cast iron pipe, 16-foot lengths.....	70.3 tons	42.35
10-inch cast iron pipe, 12-foot lengths.....	75.3 tons	41.35
10-inch cast iron pipe, 16-foot lengths.....	75.3 tons	42.35
Special fittings, 4-inch.....	550 lbs.	.03%
Special fittings, 6-inch and larger.....	9,350 lbs.	.03½%
Total on 12-foot lengths.....		\$6,701.07
Total on 16-foot lengths.....		\$6,854.16

PUMP AND MOTOR.

Name of Bidder.....	*Norwood Eng. Co. Florence, Mass.	Merkle-Hines Mch. Co., Kansas City, Mo.	Goulds Mfg. Co., Chicago, Ill.
Address.....			
Lump sum bid.....	\$940.00	\$1,270.00	\$780.00
Make of pump.....	Lawrence Pump Co.	Platt Iron Works	Goulds
Make of motor.....	G. E.	G. E.	West G. E. or Crocker
Speed of pump.....	1,150 R. P. M.	1,100 to 1,200	1,755
Size of pump.....	6-in. Suction. 5-in. Disc.	8-in. S. 6-in. D.	6-in. S. 5-in. D.
Size of motor.....	15 H. P.	15 H. P.	15 H. P.
Weight of pump.....		2,200 lbs.	1,525 lbs.
Weight of motor.....		1,200 lbs.	1,475 lbs.
Efficiency of pump.....	67%	66%	62%
Overall efficiency pump and motor.....	61%	55%	54%
Time of delivery.....	120 days	12 weeks	

*Contracts awarded. †12-inch. ‡16-inch.

streets, by grading, curbing and paving, partly on the natural and partly on a concrete foundation, as follows: 5,800 cu. yds. excavation, 95 cts.; 2,950 lin. ft. combined curb and gutter, 64 cts.; 1,900 lin. ft. concrete curb, 50 cts.; 500 lin. ft. stone curb, 70 cts.; 850 lin. ft. stone curb reset, 35 cts.; 11,500 sq. yds. asphalt pavement on a concrete foundation, \$1.78; 12,600 sq. yds. asphalt pavement on the natural foundation, \$1.28; 11 new manholes, \$35; 2 new valve manholes, \$27; 19 new catch basins, \$35; 58 manhole and catch basin covers adjusted, \$4; 1,300 lin. ft. 3x12-in. oak headers, 22 cts.; 50 lin. ft. 12-in. sewer pipe laid, 37 cts.; 1,300 lin. ft. 10-in. sewer pipe laid, 32 cts.; 400 lin. ft. 8-in. sewer pipe laid, 30 cts.; 600 lin. ft. 6-in. sewer pipe laid, 20 cts.; 2,850 lin. ft. excavating and backfilling, 32 cts.; 14 new catch basin inlets, \$10.

Meridian, Minn.—Good Roads Surface Co., for paving 24th Ave. and Fifth St., at \$15,000.

East Orange, N. J.—Bids received for concrete sidewalk as follows: Thomas G. Schriener, local, 14 cts. per sq. ft.

Passaic, N. J.—Antonio Borgi, of Wood Ridge, for paving Carlton Ave. Other bidders were: DeVoogel Construction Co., of Passaic; Jannarone Construction Co., of Belleville; Herbert Howland, of Hackensack.

Passaic, N. J.—The bids received for repair of macadam on Piaget Ave., Clifton, from the J. W. Harrop Co., the Union Building & Construction Co., and S. J. Sowerbutt, and on the different materials required are as follows: 2-in. macadam per sq. yd., laid and ready for traffic where directed, Harrop, \$0.18; Union, \$0.30; Sowerbutt, \$0.25; 4-in. macadam per sq. yd., laid and ready for traffic where directed, Harrop, \$0.24; Union, \$0.48; Sowerbutt, \$0.31; light coat of binder and screenings per sq. yd., laid and ready for traffic where directed, Harrop, \$0.12; Union, \$0.23; Sowerbutt, \$0.25; 2-in. macadam per cu. yd., laid and ready for traffic where directed, Harrop, \$2.25; Union, \$2.80; Sowerbutt, \$3; 4-in. macadam per cu. yd., laid and ready for traffic where directed, Harrop, \$2.25, \$2.35; Union, \$2.54; Sowerbutt, \$2.50; light coat of binder and screenings, per sq. yd., laid and ready for traffic where directed, Harrop, \$2.25; Union, \$2.90; Sowerbutt, \$3.75; 1½-in. stone per cu. yd., delivered where directed, Harrop, \$1.65; Union, \$2.20; Sowerbutt, \$2; 1-in. stone per cu. yd., delivered where directed, Harrop, \$1.65; Union, \$2.20; Sowerbutt, \$2; screenings per cu. yd., delivered where directed, Harrop, \$1.65; Union, \$2.25; Sowerbutt, \$2; ditching according to plan in specifications per lin. ft., Harrop, \$0.15; Union, \$0.15; Sowerbutt, \$0.15; earth excavation or fill per cu. yd., Harrop, \$0.75; Union, \$0.60; Sowerbutt, \$0.65.

Butler, Pa.—Duster Contracting Co., of Tarentum, for paving Saxonburg road, at \$96,498.48.

Wilkes-Barre, Pa.—Bids received for 16,000 sq. yds. Hastings asphalt block on a 6-in. concrete foundation, in Luzerne county, as follows: Herrick Construction Co., local, paving \$2.54 per sq. yd., total \$44,780; P. J. Boyle Construction Co., \$2.56 per sq. yd.; O'Brien Bros., Avoca, Pa., \$2.59 per sq. yd. C. Hand, engineer roads and bridges.

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Bogota, N. J.—Following are bids for sewerage system at Bogota, N. J., section No. 2. Clyde Potts, Engr., New York, N. Y.

Quantity and Items.	Averill-Matthews Co., 919 Essex Bldg., Newark, N. J.		C. S. Edwards Co., 1 Montgomery St., Jersey City.		Martin, Miller & Pizzimenti, Caldwell, N. J.		John W. Heller, South Orange, N. J.		Torielle & San- sone, Hacken- sack, N. J.	
	Unit Price.	Total Price.	Unit Price.	Total Price.	Unit Price.	Total Price.	Unit Price.	Total Price.	Unit Price.	Total Price.
4,950 ft. 8-in. V. S. P., 6-6.....	\$0.70	\$3,465.00	\$0.93	\$4,603.50	\$0.75	\$3,712.50	\$0.85	\$4,207.50	\$0.97	\$4,801.50
12,900 ft. 8-in. V. S. P., 6-8.....	.83	10,707.00	.93	11,997.00	.95	12,265.00	1.13	14,577.00	1.02	13,158.00
1,650 ft. 8-in. V. S. P., 8-10.....	1.30	2,145.00	.93	1,534.50	1.50	2,475.00	1.45	2,392.50	1.37	2,260.50
330 ft. 8-in. V. S. P., 10-12.....	1.69	557.70	1.18	389.40	2.25	742.50	2.00	660.00	1.40	462.00
8-in. V. S. P., 12-14.....	2.20	.....	1.65	.....	3.00	.....	2.60	.....	1.95	.....
8-in. V. S. P., 14-16.....	2.93	.....	1.95	.....	4.00	.....	3.50	.....	2.30	.....
450 ft. 10-in. V. S. P., 6-6.....	.70	315.00	.93	418.50	.85	382.50	1.15	517.50	1.10	495.00
875 ft. 10-in. V. S. P., 6-8.....	.87	761.25	.93	813.75	1.15	1,006.25	1.45	1,268.75	1.35	1,181.25
10-in. V. S. P., 8-10.....	1.69	.....	1.28	.....	1.75	.....	1.85	.....	1.50	.....
10-in. V. S. P., 10-12.....	1.97	.....	1.56	.....	2.50	.....	2.30	.....	2.10	.....
500 ft. deep house connections.....	1.00	500.00	.48	240.00	1.00	500.00	.50	250.00	.40	200.00
12,000 ft. B.M. lumber foundation.....	10.00	120.00	40.00	480.00	50.00	600.00	60.00	720.00	55.00	660.00
25,000 ft. B.M. lumber sheeting.....	10.00	250.00	40.00	1,000.00	25.00	625.00	50.00	1,250.00	45.00	1,125.00
3 tons cast-iron pipe.....	60.00	180.00	50.00	150.00	80.00	240.00	50.00	150.00	100.00	300.00
50 yds. concrete, 1:3:5.....	8.00	400.00	7.50	375.00	9.00	450.00	8.00	400.00	9.00	450.00
Concrete, 1:2½:4½.....	9.00	.....	7.50	.....	15.00	.....	14.00	.....	15.00	.....
101 manholes, 8 ft. each under.....	50.00	5,050.00	45.00	4,545.00	45.00	4,545.00	50.00	5,050.00	75.00	7,575.00
500 ft. extra depth over 8 ft.....	.50	250.00	.01	5.00	4.00	2,000.00	3.50	1,750.00	4.00	2,000.00
Total.....		\$24,700.95		\$26,551.65		\$29,533.75		\$33,193.25		\$34,668.25

North with bitulithic material, at \$31.019. This is the lowest bid on bitulithic material ever submitted to the city, the yardage price being \$1.80 as against \$2.05 and \$2.20 heretofore.

SEWERAGE

Indianapolis, Ind.—State National Bank of Lowell have purchased Lake county ditch bonds amounting to \$6,185.

Romeo, Mich.—A \$6,000 sewer system will be constructed. Address city clerk.

Randolph, Neb.—A \$6,000 sewer system will be constructed. Address city clerk.

Linden, N. J.—The Citizens and Taxpayers' League have decided to petition the township committee to construct a trunk sewer in the St. George section and Greater Elizabeth.

Springfield, O.—Sealed proposals will be received until 12 o'clock, noon, Sept. 25, for the purchase of sewer bonds amounting to \$17,812.60. W. J. Barrett, city auditor.

Toledo, O.—The \$150,000 Upton Ave. sewer will be readvertised by the county commissioners.

Erie, Pa.—City Engineer Lynch is now working on plans for the big west side storm water system, which is to cost \$30,000. It is planned to lay the first pipe in Myrtle St. from the lake to 12th.

Erie, Pa.—An ordinance has been passed providing for the construction of a 9-in. tile sanitary sewer in 31st St. City engineer has been authorized to advertise for bids.

Wilkes-Barre, Pa.—Representatives of Wilkes-Barre City, Wilkes-Barre township, Hanover township and Ashley borough have reached a tentative agreement over the cost of construction of a sewer that will benefit all four districts. The sewer is to be built in Hanover township, but will be so situated that it can be used by the other three districts. The sewer will for a time empty into the river, but later there will be a sewage disposal plant connected with it.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

Joliet, Ill.—See "Streets and Roads."

Fort Wayne, Ind.—The board of works have received bids on the following improvement jobs, low bidders and proposals as follows: Sewers—Alley west of Smith St. from the alley north of Rudisill Blvd. to Eckart St., France & Co., \$1.47; alley between Barr St. and Lafayette St., from Wiebke St. to sewer No. 37, C. E. Moellering Co., \$1.37; alley between Clay St. and Lafayette St., from Gummer Ave. to McKinnle Ave., C. E. Moellering Co., \$1.45; alley between Bowser Ave. and Holton Ave., from Greer St. to Eckart St., Moellering Construction Co., \$1.50; alley between Bowser Ave. and Oliver St., from Greer St. to Eckhart St., France & Co., \$1.48; alley south of Polk St., Anton Rieg, 75 cts. Alley pavements—Paving alley between Washington Blvd. and Jefferson St., from Monroe St. to Francis St., Grace Construction Co., concrete \$2.18, brick \$2.99; paving alley between Calhoun St. and Harrison St., from Douglas Ave. to Brackenridge St., Grace Construction Co., concrete \$1.49, brick \$2.10; paving alley between Washington Blvd. and Jefferson St., from College St. to Nelson St., Grace Construction Co., concrete \$2.20, brick \$3.12; paving alley between Harrison St. and Webster St., from Taber St. to Woodland Ave., Grace Construction Co., concrete \$1.87, brick \$2.72; paving alley between Fairfield Ave. and South Wayne Ave., from Wildwood Ave. to alley north, Grace Construction Co., concrete \$1.63, brick \$2.37; paving alley between Hanna St. and Weisser Park Ave., from Pontiac St. to McKee St., Grace Construction Co., concrete \$2.25, brick \$3.22.

WATER SUPPLY.

Odebolt, Ia.—Fifteen thousand dollars water works bonds have been voted. Address Village Clerk.

Riceville, Ia.—It is proposed to expend \$4,000 to improve water system. Address H. A. Yager, Town Clerk.

Stuart, Ia.—A \$20,000 bond issue is

necessary to improve and extend water system. Address Town Clerk.

New Brunswick, N. J.—Commissioner Morrison has been authorized to sell \$10,000 worth of improvement certificates to finance a contract for centrifugal pumps installed at the pumping station at Weston's Mill.

Seneca Falls, N. Y.—New hydrant service will be installed as soon as state department's map is approved.

Dallas, Tex.—Construction of a 6-in. water pipe in Worth St. between Henderson and Fulton, preparatory to paving that street has been authorized by the board of city Commissioners at \$2,414.

Richmond, Va.—Supt. E. E. Davis of the water department has been instructed to furnish estimate of cost for installing a water main in C St. from Broad to Lee Sts.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

New Brunswick, N. J.—*New York Continental Jewell Filtration Co., for installing three centrifugal pumps at the reservoir, at \$8,552. The type of pump is that of the Kingsford Foundry & Machine Works.

MISCELLANEOUS.

Marion, O.—An ordinance has been passed providing for the issuance of bonds amounting to \$3,200 to be used for sanitary purposes.

Marion, O.—\$1,500 in bonds are to be issued for the purpose of equipping the police station.

Erie, Pa.—Complete plans for the construction of the big tube over Mill Creek from Glenwood Park to the lake will be ready Sept. 5.

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